

THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

WORKING GROUP MEETING

ADVISORY BOARD ON
RADIATION AND WORKER HEALTH

Y-12

The verbatim transcript of the Working Group
Meeting of the Advisory Board on Radiation and
Worker Health held telephonically on April 11, 2006.

C O N T E N T S

April 11, 2006

WELCOME AND OPENING COMMENTS DR. LEW WADE, DFO	6
INTRODUCTION BY MARK GRIFFON	13
SEC PETITION NUMBER 28	16
RELIABILITY OF THE DATASET	32
MATRIX DISCUSSION	94
SAMPLE DOSE RECONSTRUCTIONS	126
CONCLUSIONS	161
COURT REPORTER'S CERTIFICATE	173

TRANSCRIPT LEGEND

The following transcript contains quoted material. Such material is reproduced as read or spoken.

In the following transcript: a dash (--) indicates an unintentional or purposeful interruption of a sentence. An ellipsis (. . .) indicates halting speech or an unfinished sentence in dialogue or omission(s) of word(s) when reading written material.

-- (sic) denotes an incorrect usage or pronunciation of a word which is transcribed in its original form as reported.

-- (phonetically) indicates a phonetic spelling of the word if no confirmation of the correct spelling is available.

-- "uh-huh" represents an affirmative response, and "uh-uh" represents a negative response.

-- "*" denotes a spelling based on phonetics, without reference available.

-- (inaudible)/ (unintelligible) signifies speaker failure, usually failure to use a microphone.

P A R T I C I P A N T S

(By Group, in Alphabetical Order)

BOARD MEMBERS

EXECUTIVE SECRETARY

WADE, Lewis, Ph.D.

Senior Science Advisor

National Institute for Occupational Safety and Health

Centers for Disease Control and Prevention

Washington, DC

MEMBERSHIP

GIBSON, Michael H.

President

Paper, Allied-Industrial, Chemical, and Energy Union

Local 5-4200

Miamisburg, Ohio

GRIFFON, Mark A.

President

Creative Pollution Solutions, Inc.

Salem, New Hampshire

MUNN, Wanda I.

Senior Nuclear Engineer (Retired)

Richland, Washington

PARTICIPANTS

ADLER, TIM, ORAU
BEHLING, HANS, SC&A
BRACKETT, LIZ, MJW
CHEW, MEL, CHEW & ASSOC'S
DUVALL, JAMES, PETITIONER
ELLIOTT, LARRY, NIOSH/OCAS
FITZGERALD, JOSEPH, SC&A
FIX, JACK, ORAU
HOMOKI-TITUS, LIZ, HHS
HOWELL, EMILY, HHS
KERR, GEORGE, KERR CONSULTING
KOTSCH, JEFF, DOL
MAKHIJANI, ARJUN, SC&A
MAURO, JOHN, SC&A
MCFEE, MATT, ORAU
MCGOLERICK, ROBERT, HHS
NETON, JIM, NIOSH
PRESLEY, BOB, ABRWH
REED, STEVE, ORAU
RICH, BRYCE, ORAU
RUTHERFORD, LAVON, NIOSH
SMITH, MATTHEW, ORAU
STEMPFLEY, DAN, ORAU
SUNDIN, DAVE, NIOSH
TANKERSLEY, BILL, ORAU
THOMAS, ELYSE, ORAU

P R O C E E D I N G S

(1:00 p.m.)

WELCOME AND OPENING COMMENTS

DR. LEWIS WADE, DFO

1 DR. WADE: This is Lew Wade again, and I have
2 the pleasure of serving as the Designated
3 Federal Official for the Advisory Board. This
4 is a working group of the Advisory Board, so
5 far the hardest working of the working groups.
6 This working group that's chaired ably by Mark
7 and populated by Mike, Wanda and Robert has
8 taken on a variety of issues, among them
9 individual dose reconstruction reviews,
10 procedures reviews. They have recently been
11 very involved in site profile reviews,
12 particularly the reviews of the site profiles
13 for Y-12 and Rocky Flats.

14 This meeting, however, marks the first
15 formal time this working group will be talking
16 about the SEC petitions for today, Y-12, and
17 tomorrow for Rocky Flats. The decision was
18 made, and I think quite correctly, that this
19 working group would continue with its pursuit

1 of the Rocky Flats and Y-12 issues that it
2 ably began when it was doing the site profile
3 reviews rather than ask Dr. Melius' working
4 group which is equally talented to pick up Y-
5 12 and Rocky from an SEC point of view. So
6 that's what we're here to do today, Y-12, and
7 tomorrow starting at 10:00 a.m. eastern time,
8 Rocky Flats.

9 I would like to have, spend some time
10 on conflict of interest issues. Again that
11 looms large now in our reality and with regard
12 to the Board, the way the Board has developed
13 its own rules for dealing with SEC petitions,
14 if a Board member is conflicted at a
15 particular site, then they back away from the
16 table during SEC discussions. They can make
17 comments as a member of the public. They can
18 participate and listen to a meeting as a
19 member of the public but not at the table as a
20 Board member. Obviously, they wouldn't be
21 making motions or voting on motions in that
22 case.

23 Relative to Y-12, we have Board
24 members who are conflicted. They are Dr.
25 DeHart, Robert Presley, Dr. Ziemer, Mark

1 Griffon only when an action has been filed by
2 the Atomic Trades and Labor Council. So for
3 this call, although they're not with us right
4 now, DeHart, Presley and Ziemer would be
5 conflicted.

6 Before I go on and ask others to
7 identify conflicts as it relates to Y-12, I
8 would remind you that we don't want to have a
9 quorum present for a working group. That
10 makes it a Board meeting and different rules
11 prevail. So I would ask Board members when we
12 go through the introductions to identify
13 yourselves. And I noticed that Liz sent an e-
14 mail out if any Board members are to join us
15 mid-discussion, they need to identify
16 themselves so Liz and Emily and I can keep
17 count of our numbers and deal with any quorum
18 issues.

19 Again, if we find ourselves at or over
20 a quorum then we would have to respectfully
21 ask the last person to join us to leave so
22 long as that person wasn't a member of the
23 working group. We always want to have the
24 working group members present.

25 To finish my sort of long-winded

1 introduction, as you know the government is in
2 receipt of a petition for Y-12, in fact,
3 several, and NIOSH has recently released a
4 petition evaluation report that I know you all
5 have and have at varying degrees of review
6 based upon the short time that you've had it.
7 We're looking at least a timeline now would be
8 for NIOSH to formally present its
9 recommendation at the Board meeting scheduled
10 for the end of April in Denver, Colorado. And
11 then the Board would begin its deliberations.

12 So with that as a background and
13 before I turn it over to Mark, let me ask that
14 the NIOSH team, that would include folks from
15 ORAU and then SC&A, identify anyone who's on
16 the line and will participate and particularly
17 identify those people who have conflicts
18 relative to Y-12. Again, if a person is
19 conflicted, then as you know they would be
20 conflicted in terms of serving as an author or
21 a reviewer for key program documents. It
22 wouldn't preclude them from making a statement
23 to add to the technical discussion on this
24 call, but it's important that those people are
25 clearly identified. And when they make a

1 statement people hear their statement
2 understanding the conflict that they possess.

3 So, Jim, if I could ask you. I don't
4 know who will do it for NIOSH. Whoever's
5 going to start the discussion for NIOSH
6 relative to conflict of interest for the
7 entire NIOSH team including the ORAU folks.

8 **DR. NETON:** This is Jim Neton sitting in, I
9 have moved from the Marriott Hotel to
10 Cincinnati, NIOSH buildings here. I'm sitting
11 here and LaVon Rutherford is here with me from
12 NIOSH. We've got some ORAU folks sitting
13 around a table with me and others are on the
14 phone. And honestly, I don't know who they
15 are, so I guess we'll just let the ORAU folks
16 who are around the table in Cincinnati
17 identify themselves and if they have
18 identified conflicts. And then the ORAU
19 people on the phone would follow suit.

20 **MR. FIX:** My name is Jack Fix. I'm with
21 Dave Muller and Associates, and I don't
22 believe I'm conflicted with regards to Y-12.

23 **MS. THOMAS:** I'm Elyse Thomas, and I'm with
24 ORAU, and I'm not conflicted with Y-12.

25 **MS. BRACKETT:** Liz Brackett with MJW, and I

1 am conflicted with Y-12.

2 **MR. McFEE:** Matt McFee with MJW, and I'm not
3 conflicted with Y-12.

4 **DR. NETON:** And now for the ORAU folks that
5 are on the phone.

6 **MR. SMITH:** This is Matthew Smith, ORAU
7 team, Dave Muller and Associates, not
8 conflicted with Y-12.

9 **MR. TANKERSLEY:** Bill Tankersley, ORAU.

10 **DR. WADE:** Any conflict?

11 **MR. TANKERSLEY:** No.

12 **MR. KERR:** George Kerr, no conflict.

13 **(UNINTELLIGIBLE):** No conflict.

14 **MR. ADLER:** Tim Adler, no conflict.

15 **MR. CHEW:** Mel Chew with the ORAU team. I
16 am not conflicted with the Y-12.

17 **MR. RICH:** This is Bryce Rich. I'm not
18 conflicted.

19 **MR. STEMPFLEY:** This is Dan Stempfley with
20 the ORAU team, and I'm not conflicted.

21 **DR. WADE:** Does that finish the NIOSH/ORAU
22 introductions?

23 **MR. ELLIOTT:** Well, from NIOSH, Lew, this is
24 Larry Elliott, and Jim Neton and I have signed
25 off on approving this SEC evaluation report,

1 and from my perspective I'm not conflicted.

2 Jim, you should speak about your
3 situation.

4 **DR. NETON:** I don't believe that I'm
5 conflicted at Y-12.

6 **DR. WADE:** Anyone else from the technical
7 team, NIOSH/ORAU?

8 (no response)

9 **DR. WADE:** How about SC&A?

10 **DR. MAURO:** This is John Mauro from SC&A. I
11 am not conflicted, and I'd like to handle it
12 the same way that Jim did and ask the
13 participants on the phone from SC&A to each
14 introduce themselves and make their statement.

15 **MR. FITZGERALD:** This is Joe Fitzgerald.
16 I'm not conflicted on Y-12.

17 **DR. MAKHIJANI:** This is Arjun Makhijani.
18 I'm not conflicted on Y-12.

19 **DR. BEHLING:** Hans Behling, not conflicted.

20 **DR. WADE:** Does anybody have any questions
21 or comments they wish to make about the
22 conflict of interest policies or situation?

23 (no response)

24 **DR. WADE:** Okay, Mark, I'll turn it over to
25 you then. I think we could do broader

1 introductions, but I wanted to make sure we
2 had the conflict of interest discussion.

3 **INTRODUCTION BY MARK GRIFFON**

4 **MR. GRIFFON:** This is Mark Griffon, and I
5 think we should do the same for the Board just
6 to see who's on from the Board. I assume the
7 whole work group is, but this is Mark Griffon.
8 Who else is on?

9 **MS. MUNN:** Wanda Munn, no conflict.

10 **MR. GIBSON:** Mike Gibson, no conflict.

11 **MR. GRIFFON:** And Bob's not on or --

12 **DR. WADE:** He might be joining. If he does,
13 he'll identify himself.

14 **MS. MUNN:** He said he'd have to be on and
15 off today because of what's going on.

16 **DR. WADE:** And Robert is conflicted, and I'm
17 sure he'll tell us that.

18 Any other Board members on the call at
19 the moment?

20 (no response)

21 **MS. MUNN:** Lew, if you don't mind, I'd like
22 to interject that when I saw the message this
23 morning from Liz, I immediately sent a message
24 back saying it's not clear to me with our
25 present configuration exactly how many

1 additional members over the four members of a
2 working group would be, would constitute a
3 conflict (sic). And I had just gotten a
4 message back from her saying three would.

5 **DR. WADE:** Well, we were not over, we're not
6 in a quorum this morning.

7 How about other federal employees
8 identifying themselves?

9 **MS. HOMOKI-TITUS:** Liz Homoki-Titus, Health
10 and Human Services, and I don't have any
11 conflicts.

12 **MS. HOWELL:** This is Emily Howell from
13 Health and Human Services with Robert
14 McGolerick from Health and Human Services, no
15 conflicts.

16 **(UNINTELLIGIBLE):** (Unintelligible) NIOSH,
17 no conflicts.

18 **MR. KOTSCH:** Jeff Kotsch, Department of
19 Labor.

20 **DR. WADE:** Any other feds?

21 **MR. SUNDIN:** Dave Sundin, no conflicts.

22 **DR. WADE:** This is Lew Wade again, no
23 knowledge, therefore, no conflicts.

24 **MR. GRIFFON:** And, Lew, I was just going to
25 ask, any of the petitioners online for this

1 call?

2 (no response)

3 **MR. GRIFFON:** Apparently not.

4 **DR. WADE:** Is there anyone else who would
5 like to identify themselves? It's up to you
6 totally.

7 **MR. DUVALL:** Hello, James Duvall, Execution
8 28.

9 **MR. ELLIOTT:** Mr. Duvall is one of the
10 petitioners for Y-12.

11 **DR. WADE:** Welcome, and as our rules are, if
12 you have anything to say through this process,
13 please feel free to chime in. Petitioners are
14 more than welcome to participate in the
15 discussion.

16 **MR. GRIFFON:** I think the best way to
17 proceed here is if I think most of us now have
18 the handouts or are getting the new documents.
19 But I think maybe what makes more sense is to
20 go through the evaluation report, have NIOSH
21 present on that, and what I might do, Jim,
22 while you present it or whoever's going to
23 present, I might keep track of the matrix that
24 we were using for our previous discussions.
25 And that any time if there's any point of

1 clarification or whatever, I'd ask either the
2 Board members or SC&A to step up and ask for
3 clarifying points. Also, if there's any
4 outstanding actions which are related to
5 certain areas, I might try to interject and
6 see if those actions were completed, if
7 they're still pending, if they're, you know,
8 what the status is on those actions just to
9 sort of complete that process as well.

10 So with that I guess I'll turn it over
11 to Jim and whoever's going to sort of walk us
12 through this report.

13 **DR. NETON:** Mark, I'm not quite sure, do you
14 want me to give a summary of what we've done
15 here or did you want me to bring in the
16 relevant issues related to the matrix?
17 Because I --

18 **MR. GRIFFON:** I think if you can start to go
19 through a summary of what is in the report, I
20 think it would be good, first of all. And
21 then maybe if it makes sense to go through
22 specific sections. And then I think the
23 action items will sort of fall out as we
24 discuss each section, if that makes sense.

25 **SEC PETITION NUMBER 28**

1 **DR. NETON:** Well, this is the petition
2 evaluation report for SEC petition number 28
3 which the petitioner original class definition
4 was all steamfitters, pipe fitters and
5 plumbers who worked at Y-12 from October 1944
6 through December 1957. NIOSH, after having
7 gone through and evaluated a number of sources
8 of information which I'll talk about shortly,
9 modified the class to a proposed class
10 definition of all employees of the DOE or DOE
11 subcontractors who were monitored or should
12 have been monitored for thorium exposures in
13 some specific buildings. And those buildings
14 are Building 9202, 9204-1, 9204-3, 9206 and
15 9212. If one worked in those buildings and
16 was monitored or should have been monitored
17 for thorium for the 250-day work period from
18 January '48 through December '57 that would be
19 our proposed class.

20 As typical with SEC evaluation
21 reports, NIOSH started out by reviewing a
22 number of data sources. The documentation
23 literature available on Y-12 is fairly
24 extensive as we discussed in past working
25 group meetings. We do have a site profile

1 document. There are a number of Technical
2 Information Bulletins reports out there. I
3 think there are seven or more supplemental
4 pieces of technical documentation that have
5 been written about Y-12 in particular relative
6 to the external and internal monitoring
7 programs. Those were cited in the report in
8 review.

9 A number of interviews were conducted
10 with employees and site experts including
11 health physicists and workers for several
12 purposes. Some were conducted to determine
13 the robustness of the monitoring program, and
14 there was a supplemental interview conducted
15 to determine the nature of weapons-related
16 work in a specific timeframe.

17 We also looked at previous dose
18 reconstructions in a site research database,
19 and in particular a large part of our
20 evaluation centered on the Center for
21 Epidemiologic Research database where we did
22 some quality control evaluations as well as
23 some data integrity and reliability reviews.

24 Also looked at the Y-12 Delta view
25 system that those who are on the working group

1 are aware was discovered fairly recently that
2 a, it's not an electronic database in the
3 strictest sense of the word. It's really an
4 image database that has, I think, over 400,000
5 individual images within its system. And of
6 course, we looked at the documentation
7 affidavits provided by the petitioners.

8 Just to briefly go over some of the
9 radiologic operations, Y-12, of course, is
10 primarily, primary hazard of exposure at Y-12
11 is uranium. There were large amounts of
12 uranium processed, and in particular enriched
13 uranium at Y-12 over the history of the plant.
14 But in addition, where there are what I'll
15 call ancillary sources of exposures to much
16 smaller source terms but nonetheless
17 significant. Those would include exposures to
18 thorium, plutonium, some neptunium, tritium
19 and a few other radionuclides as well as
20 exposures that may have occurred at the
21 cyclotron operation, in '86, the cyclotron
22 that made what we've come to call exotic
23 radionuclides for the most part.

24 We reviewed all the exposure
25 potentials at those sites that related to the

1 individual types of exposures, whether they be
2 alpha, beta, gamma or neutron exposures or x-
3 ray generating equipment. And also looked at
4 the extent of the handling of recycled uranium
5 at the Y-12 facility.

6 So looking at all the available
7 monitoring data, we feel that for uranium
8 exposures at Y-12, we have sufficient
9 information to reconstruct internal and
10 external exposures for those who were exposed
11 to uranium at Y-12 between the, in the class
12 period as well as we can reconstruct exposures
13 that occurred at the cyclotron and some of the
14 Calutron operations that handled plutonium.

15 Where we believe there is a deficiency
16 in the data to reconstruct doses is in the
17 area of thorium exposures. We have come to
18 learn that thorium was in existence at the Y-
19 12 site from the beginning of this class
20 period through the end of the class period and
21 was used for several different purposes during
22 that timeframe. We have no internal
23 monitoring data for fecal or urine samples
24 that we can find. I think there were samples
25 that were taken, but we just don't have them

1 in our possession in the SEC period. And we
2 have just come across very recently some air
3 monitoring data related to the Calutron
4 operations, but we have had insufficient time
5 to review those data and are not prepared to
6 use those in dose reconstruction. So we are
7 not considering them a viable source for this
8 SEC class.

9 So at the end of the day we're
10 recommending that anyone who had worked with
11 thorium operations or should have been, were
12 monitored or should have been monitored for
13 thorium activities at the facility in the
14 buildings I've mentioned at the beginning of
15 my discussion would be covered as part of the
16 SEC. But we feel that we have adequate
17 information to address the other sources of
18 exposures that I've discussed.

19 It's a pretty thumbnail sketch of a
20 140-page document which I'm sure we can go
21 into a lot more detail, but I've hit the
22 highlights.

23 **MR. GRIFFON:** I'm just wondering the best
24 way to proceed here. I mean, we could either
25 go through the matrix or we could, I'm looking

1 at section six where you discussed available
2 monitoring data. I mean, the operations stuff
3 we can probably read at our own opportunity.
4 But it might be useful if you could maybe, you
5 touched on some of this, but maybe go through
6 the available monitoring data a little more
7 closely.

8 **DR. NETON:** What page does section six start
9 on?

10 **MR. GRIFFON:** Twenty-three on my printout
11 anyway.

12 **DR. NETON:** For the internal monitoring data
13 let me start with the uranium data and the
14 data relevant to uranium and the external
15 monitoring data that we have. There's Table
16 6.2 on page 27 that summarizes that. And as
17 we've discussed in the past -- I'm sorry, it's
18 on page 26. Back in the early years, 1948 and
19 '49 we have no internal, no uranium bioassay
20 data that we could find for the class. But we
21 have data starting in 1951, and as you see,
22 the number of samples ramps up from about
23 1,000 in 1950 terminating at the end of the
24 class or 1957 with 33,000 samples. So there's
25 a large amount of uranium monitoring data

1 available.

2 There is a Technical Information
3 Bulletin that we have that has taken these
4 monitoring records and converted them into a
5 coworker model where we've developed
6 individual exposures by year with geometric
7 standard deviations that we apply to those who
8 were not monitored. As you can see there were
9 a small percentage of the overall workers
10 monitored the earlier years, but through
11 discussions and other information that we've
12 come to learn -- and this is contained in the
13 evaluation report -- we believe that it was
14 ORAU's policy consistently throughout the SEC
15 period to monitor those workers with the
16 highest potential for exposure.

17 What did I say?

18 **MR. GRIFFON:** ORAU's policy.

19 **DR. NETON:** Y-12, sorry.

20 **MS. MUNN:** Jim, may I interrupt you long
21 enough to ask whoever has a small child in
22 their hearing area, would they please mute
23 their phone? It sounds like a really sweet
24 kid, but it's hard to hear the numbers over
25 it.

1 **MR. GRIFFON:** Thank you. I think they did
2 it.

3 **DR. NETON:** And like the lack of data in '48
4 and '49 we've accounted for by back
5 extrapolating into that period using the data
6 in '50 forward, and we believe that it's
7 fairly representative based on an analysis of
8 the types of operations that were ongoing in
9 '48 and '49 versus the later years. That is,
10 there weren't much uranium activities ongoing
11 in '48 and '49. That was after the Calutron
12 had been shut down.

13 One can look at Table 6.2 and the
14 external monitoring records and there's a
15 similar picture, that is, well, we start off
16 in '48 with a fair number of records,
17 diminished in the early '50s and then
18 increased later on. But again we feel in this
19 particular case as we discussed we have gone
20 from 1961 backwards into, we have an
21 extrapolation mode to predict the external
22 badge results in the pre-'60 period based on
23 the Technical Information Bulletin that we've
24 discussed at several of our working group
25 meetings.

1 And George Kerr is on the phone, and
2 I'm sure we can discuss more about that later
3 if we'd like to get into that. So for the
4 uranium operations we feel that these data
5 allow us to have a pretty good handle on
6 uranium exposures.

7 If one looks on page 24 and Table 6-1
8 though I did mention early on that we have
9 exposures to non-uranium isotopes, and in
10 particular, there were plutonium exposures
11 related to the, I think starting in about the
12 1952 timeframe, the Calutrons were used to
13 enrich plutonium. But we do have from the
14 Delta view system about 740 plutonium samples
15 that were collected during the active period
16 of operation of plutonium enrichment. We
17 believe that we can use these samples to bound
18 plutonium exposures for the workers on the
19 Calutron operations.

20 Now it may appear that that's a small
21 number of samples, but we believe relative to
22 the number of people actually working this
23 process that it's a fairly good sampling of
24 the workers particularly in light of the fact
25 that we feel fairly confident it's

1 consistently been portrayed that the Y-12
2 facility monitored workers who were
3 preferentially monitored workers who had the
4 highest potential for exposure.

5 As you see in this table there are
6 zero thorium results available between 1952
7 and '57; however, starting in '58 you'll see
8 that there are some thorium samples. I
9 believe those are thorium fecal samples that
10 were started to be collected in those time
11 periods as the facility ramped up to do large-
12 scale processing of thorium starting in the
13 1960s. We believe this is one of the reasons
14 that the cut point is at '57. We believe
15 these thorium samples can help us bound
16 thorium exposures in that timeframe.

17 The CEDR data we have, and that's
18 where all of the urine data came from, and
19 I'll talk a little bit later about what we've
20 done to, or we can get into that later, what
21 we've done to -- not the CEDR data, the CER
22 data -- what we've done to evaluate the
23 quality and the pedigree of that information.

24 One important source of information
25 that we have are the health physics progress

1 reports that were consistently written and
2 available starting in the early days of
3 operation at the facility. And they have some
4 really good descriptions of normal operations
5 as well as off-normal operations including
6 incident exposures. In fact, we believe that
7 this source is an excellent source of
8 information related to reconstructing
9 radionuclides that were produced at the
10 cyclotron operations.

11 The cyclotron itself was when the
12 targets were primarily, they were clad and the
13 potential for internal exposure was fairly
14 minimal unless there was a rupture of the
15 target itself due to an excessive amperage or
16 something like that or a proton exposure on
17 the target. So those are documented very
18 well, at least the ones that I've looked at
19 and our team has looked at, so that we believe
20 that these incidents, when they occurred,
21 these were not episodic events, they weren't
22 routine exposures and that we can use those to
23 help bracket the potential exposures in the
24 cyclotron operations.

25 As well as incident reports are

1 available and we checked in some claimant
2 files that we backtrack and we do have
3 incident reports available. One can look in
4 the health physics report and see the incident
5 and then find that you have incident records
6 in the claimant's file. So we feel
7 comfortable with the fact that we can
8 reconstruct the exposures to these short-lived
9 radionuclides at the cyclotrons.

10 As far as, let's see, I think I've
11 covered plutonium, uranium --

12 **MR. GRIFFON:** Jim, just to interrupt for a
13 second. Are those HP reports on the O drive?

14 **DR. NETON:** Yes, they are.

15 **MR. GRIFFON:** Okay, those are the same ones
16 that have been, okay.

17 **DR. NETON:** There are some that are not
18 there that are available but they are still
19 classified. That's why they aren't available,
20 the information has not necessarily been
21 declassified. But the early time period
22 through 1953, I believe, are there, and we
23 have one from '56. But we do believe we have
24 access to all the health physics progress
25 reports.

1 **MR. GRIFFON:** Because I think the ones I've
2 looked at don't discuss as much of the
3 cyclotron operations, at least I don't recall,
4 but anyway, they're on the O drive except if
5 they're still going through declassification.

6 **DR. NETON:** Yes, so that covers that.

7 The thorium I talked about. Oh, there
8 was a neptunium potential for exposure to
9 neptunium. By the way, a lot of this
10 information was really good. You know, we had
11 these great working group discussions and SC&A
12 was very helpful in bringing these all out to
13 the fore.

14 The neptunium was a result of, the
15 only neptunium exposure potential that I'm
16 aware of was a result of the desire to extract
17 neptunium out of the recycled uranium feed
18 stream to be used as a target to make, I
19 think, Plutonium-238. That was performed on a
20 special column basis made by the X-10
21 facility, and the material was brought
22 through, deposited on a column -- it was a wet
23 process, taken off, and then sent over to X-10
24 for processing. So we don't believe that
25 there is a credible exposure scenario,

1 internal exposure scenario, from that
2 operation to the Y-12 facility people.

3 I think I've covered most of that.
4 Let me talk a little bit about external. I've
5 mentioned that we have the external badges.
6 We have a fair number of them after '61 that
7 we developed a scaling procedure to go back
8 prior to '61 to fill in unmonitored workers'
9 doses. The neutron exposures at this facility
10 we believe, and it's documented fairly well,
11 to be low.

12 There is a Report 33 that was written
13 by ORAU for NIOSH that documents that between
14 1952 and '63 there were only 375 positive
15 quarterly neutron readings for 143 individual
16 workers. And in fact, the exposures on these
17 positive badges during this entire time period
18 was fairly low. I think the 95th percentile of
19 all the positive neutron badged results in
20 that time period is 336 millirem.

21 There are almost, the only credible
22 exposure to non-monitored, for unmonitored
23 uranium exposure, unmonitored neutron
24 exposures may be in the storage area where
25 enriched uranium was stored. There certainly

1 was potential for neutron exposures at the
2 cyclotrons and the calibration laboratory, and
3 I think that was the two other locations.
4 There might be one more. But in those
5 facilities it's pretty well established that
6 neutron monitoring did, it was worn.

7 Starting in '49, neutron-sensitive
8 film was added and exchanged. And workers
9 were assigned these neutron-sensitive films
10 from '50 to '61, but they were not always
11 read. If you worked in an area where there
12 was a potential for neutron, the badge was
13 read. If you did not work in an area where
14 there was potential for exposure, the badge
15 was not read, and in fact, zeros could have
16 been entered into the record.

17 So it does create a little bit of a
18 confusing picture, but again, the neutron
19 exposures at Y-12 are few and far between.
20 And the documented evidence that we have from
21 the 147 workers that have positives in the
22 ten-year period is the 95th percentile, 330-
23 something millirem.

24 I think that kind of sums up where
25 we're at with the exposure scenarios. If

1 you'd like, I can talk a little bit about what
2 was done for the reliability of the dataset.

3 **RELIABILITY OF THE DATASET**

4 **MR. GRIFFON:** Yeah, I think that would be,
5 yeah, that would make sense and that would go
6 right into the first section of the matrix,
7 too.

8 **DR. NETON:** You can probably tell I wasn't
9 prepared to do this ad lib. I'm muddling
10 through it I think okay.

11 There's an Appendix 1 of the document
12 that's what's called Monitoring Data
13 Sufficiency, and it goes through and lists the
14 available information we have and how we
15 believe it assists us in doing dose
16 reconstructions. The first thing that's
17 discussed are the Y-12 progress reports, and I
18 won't go over that again. I went over that in
19 some detail just a bit ago.

20 We also looked at employee interviews,
21 and those were done to help support the
22 contention that based on available
23 documentation, that is, procedures and
24 policies, that the highest exposed workers
25 were monitored. The health physics staff

1 supported that contention through interviews.
2 And in fact, one of the Technical Bulletins
3 that have been written has gone through and
4 demonstrated that based on an analysis of the
5 data, which is included.

6 As far as the credibility and
7 representativeness of the data a few things
8 were attempted. None of these are exhaustive.
9 There are certain time constraints on us, and
10 the availability of the data was not as great
11 as we would have liked. But we looked at,
12 ORAU and NIOSH looked at a number of different
13 pieces of information to help confirm that the
14 Center for Epidemiologic Research database was
15 indeed, did indeed capture the exposure
16 information for the workers, you know,
17 properly capture it.

18 What we've done is gone back and
19 looked at the individual external monitoring
20 results that were on data view, the Delta view
21 document image, compared their results to the
22 ones that are on the Y-12 records, electronic
23 records, the CER records. We looked at the
24 health physics progress reports, comparing the
25 numbers of data records present to those in

1 the electronic record. We actually found in
2 the progress reports monitoring results for 21
3 specific people, and we compared those. And
4 then there were also these punch cards that
5 were found, about 40 of them, and they were
6 also compared to the electronic record.

7 Speaking of the urinalysis results,
8 first, the 22 individuals found in a 1952, I
9 think it was, progress report, somewhere in
10 that timeframe -- yeah, I think it was '52,
11 '53. The result matched up virtually
12 identically. There were no differences in the
13 results with the exception of one worker who
14 his official record had an additional sample
15 that was left out of the average, apparently
16 left out of the average that was included in
17 the health physics reports. And that value
18 appeared to be an outlier that was retained in
19 the electronic database which made some sense
20 to us. Rather than censoring the database,
21 you know, it was left in there.

22 I think the situation was that there
23 were three results reported -- I can't
24 remember the exact results. It was like 157,
25 152 and a second sample taken on the same day

1 had a value of 2. Clearly, there's something
2 wrong with one of those values, and that value
3 was not reported in the health physics report.
4 But other than that the data matched
5 identically.

6 **MS. MUNN:** That's reassuring.

7 **DR. NETON:** Also, the health physics reports
8 did not have a lot of individual data that we
9 could compare. I think those 22 were the only
10 ones we could find at a time available. But
11 they did have a lot of data related to the
12 range of values, the 50th percentile for the
13 period, 75th, 95th percentile, those types of
14 sort of generic statistics.

15 We've gone back and looked at those,
16 pulling the data off of the health physics
17 graphs, the report graphs, and comparing them
18 to what's, you know, looking at the actual
19 data in the electronic database, there's a
20 table that we put in here, Table 3-2 that
21 shows that there is fairly, pretty good
22 agreement, broad agreement among the ranges
23 reported in the health physics reports and
24 what's in the Y-12 electronic database. There
25 are some discrepancies, but again, we're

1 pulling these things off of graphs and, we
2 didn't expect them to be perfectly in
3 agreement.

4 **MR. GRIFFON:** Jim, this was done for one
5 health physics report or did you do multiple
6 ones and just include one --

7 **DR. NETON:** I think this was one health
8 physics report I believe which is number 1952
9 health physics report. Another test that was
10 done, we looked through the database and where
11 there was a maximum value reported in a
12 specific year, in a 1952 progress report, the
13 maximum value reported is 795 dpm for 24
14 hours. And in fact, that was the maximum
15 value in the electronic database in that time
16 period. So there was fairly, we would say,
17 good agreement, not perfect agreement, but
18 good agreement between the health physics
19 reports and the Y-12 database.

20 One area where there was a larger
21 discrepancy, and we talked about this in
22 previous working group meetings, was in the
23 comparison of the actual number of samples
24 reported by monitoring period. Typically, the
25 progress reports identified more samples than

1 were in the database. But interviews were
2 conducted with laboratory workers who we
3 believe were knowledgeable about operations in
4 those time periods, and it seemed that the
5 health physics reports included more than just
6 the individual results for a worker.

7 In other words, there were quality
8 control samples, other samples that may have
9 been taken. There's some questions of whether
10 a sample was measured both for uranium, alpha
11 activity as well as fluorometrically. Those
12 kinds of issues were raised which tend to
13 support the findings. You know, there would
14 be more samples in the health physics reports
15 than in the database.

16 The punch card comparison, after
17 extensive searching we finally found, when I
18 say we I use it in the general sense. I was
19 not involved in this but ORAU certainly did a
20 lot of this work. We learned early on that
21 the data, we couldn't find any laboratory
22 notebooks, but we learned early on that punch
23 cards were used where actual people would
24 write the data, the analyst would write the
25 data on the pre-punched card, which would be

1 fed into the electronic database.

2 And after some significant searching
3 we identified a set of cards that were not in
4 the SEC period but were from a later period.
5 I believe it was somewhere in the '70s. I
6 can't recall exactly. And we pulled 36 of
7 those cards that had the numbers written on
8 them and compared them to the records in the
9 electronic database. There was very good
10 agreement with the database with the punch
11 cards as far as the samples having been taken
12 and those types of issues.

13 Unfortunately, the punch cards did not
14 have a final result. I think that was the
15 result, that was the reason the computer cards
16 were used. They would actually fold in the
17 appropriate background and calibration factors
18 and come up with a result. By applying what
19 we felt to be fairly reasonable values for
20 those factors, we were able to demonstrate
21 that the data from the punch cards was
22 consistent with what was in the electronic
23 database, at least in this 1970's timeframe.

24 We do believe that this was, the punch
25 cards go back fairly far, maybe as late, early

1 as the late '40s but certainly into the early
2 '50s.

3 **MS. MUNN:** This is Wanda. Did I hear you
4 say --

5 **DR. NETON:** I'm sorry, Wanda, we're having
6 trouble hearing you.

7 **MS. MUNN:** I'm sorry. I'll try to get my
8 microphone a little closer to my mouth. Is
9 this better?

10 **DR. NETON:** Yeah, a little better.

11 **MS. MUNN:** Did I understand you to say that
12 the cards were pre-punched and then the data
13 was written onto them?

14 **DR. NETON:** No, I think the data was written
15 on them and then they were punched and read
16 into the computer.

17 **MS. MUNN:** Okay, that's what I would have
18 expected.

19 **DR. NETON:** In other words instead of
20 keeping a laboratory list or something, you
21 would write the analytical results in the box
22 on top of the card and then a keypunch
23 operator would go enter the data.

24 **MR. GRIFFON:** Jim, I get the impression that
25 only some of them had handwritten values on

1 them, not --

2 **DR. NETON:** That's true.

3 **MR. GRIFFON:** -- most of the cards.

4 **DR. NETON:** That is true.

5 **MR. GRIFFON:** And did, this is sort of
6 getting into our action list, but was there
7 any follow up on the other cards that the idea
8 of comparing the punched values to the
9 database --

10 **DR. NETON:** No.

11 **MR. GRIFFON:** -- in the time period in
12 question.

13 **DR. NETON:** I don't want to speak for ORAU.
14 I'll ask if ORAU has anyone on there that
15 could comment on that. I don't recall, I
16 don't think we've done that.

17 **MR. GRIFFON:** I could catch that in the
18 matrix, too, when we go through, but I just
19 was curious, not to interrupt.

20 **DR. NETON:** Bill Tankersley, are you on the
21 phone? Was that done at all do you know?

22 **MR. TANKERSLEY:** I began to attempt to read
23 the cards, and they certainly could be read,
24 but I think typically for reading the cards
25 was located in another place and, no, I have

1 not followed up on that. I'm sure that the
2 values can be read.

3 **DR. NETON:** Thanks, Bill.

4 **MR. TANKERSLEY:** Excuse me one more moment,
5 and by the way, Mark, now, I don't think it's
6 exactly accurate to say that only a few of the
7 cards, all of the cards in that period of time
8 had --

9 **DR. NETON:** Bill, could you get a little
10 closer? We're having trouble hearing you.

11 **MR. TANKERSLEY:** It's not really accurate to
12 say that only a few of the cards had
13 handwritten data on them. All of the cards in
14 that period of time had the data written on
15 them. They were pre-punched with the person's
16 name and department number and so forth, and
17 then they wrote the data on them (telephonic
18 interruption) in another period that did not
19 have the handwritten data on it. I don't
20 understand that because it was an earlier
21 period, but all of the cards during that '70s,
22 I've forgotten exactly the years that we
23 looked at, but all of them had data written on
24 them.

25 **MR. GRIFFON:** Okay, I didn't mean to

1 misrepresent that. So it was during that time
2 period most of them had or all of them had
3 handwritten data.

4 **MR. TANKERSLEY:** Yes, they would all, Mel
5 and them only got, I think, 50 or so of those,
6 and then 14 of those were outside of the
7 period that we looked at the database. That's
8 the reason why there were 36 of them. They
9 were all obviously there.

10 **MR. GRIFFON:** But during the petition time
11 frame, or I don't know if you found any cards
12 for the petition time frame?

13 **MR. TANKERSLEY:** No, we have not been able
14 to find any prior to, I think, '65.

15 **MR. GRIFFON:** Someone's got another
16 conversation going on, I think.

17 **MS. MUNN:** Yeah, we have another woman
18 carrying on a conversation with somebody.

19 **MR. GRIFFON:** Keep it down or move into
20 another room or something.

21 **MS. MUNN:** This is Wanda as just kind of a
22 side comment. I wouldn't even have been
23 surprised to see one set, some of the data
24 recorded in pencil and some not having been
25 one of the individuals who was often involved

1 in keypunch operations myself.

2 And that other conversation is still
3 going on.

4 **DR. WADE:** This woman who's having a
5 conversation that we can hear, please mute it
6 or end the conversation or in some way spare
7 the rest of us from listening to it.

8 **MS. MUNN:** The proficiency of the keypunch
9 operator often had a great deal to do with
10 what information was recorded or not. That
11 may have no bearing on what we're talking
12 about, but it was a reality of that time
13 period.

14 **DR. WADE:** Nobody else talk. Let me just
15 hear a word and get her attention. Well,
16 maybe it's gone away.

17 **MR. GRIFFON:** I think, Jim, we'll turn it
18 back to you.

19 **DR. NETON:** In the external dosimetry area,
20 ORAU could actually look, looking through
21 about a 1,000 Delta view images was able to
22 find a list of 28 individual employees who had
23 at least one positive weekly result in their
24 record so that we could use that to compare to
25 what's in the electronic database. Because as

1 you remember, some of the, much of the ORAU
2 data in the early years is summary data now.
3 We've lost the individual, you know, we've not
4 lost, individual readings have not been
5 preserved in the electronic database.

6 So there was a period of 1953 where
7 the weekly Delta view results were compared to
8 the Y-12 electronic database, and I think we
9 talked about this in the past, that's included
10 in Table 3-3 on page 15 of supplement of
11 Appendix 1. And there was in general
12 agreement, but there were differences. But
13 the differences were not to be unexpected
14 because of what was going on with censoring of
15 data as far as detection limits and those type
16 of issues. But again, we believe that they're
17 fairly consistent and predictive, that the
18 database at least captures these people and
19 has their doses of record represented
20 properly.

21 One thing that's not in here that I
22 just learned yesterday, and at the risk of
23 doing one of these throwing things on the
24 table at the eleventh hour, we have been
25 looking and looking for the, a document that

1 indicated that the DOE, the Department of
2 Energy had accepted the electronic database as
3 the data of record for Y-12. Well, we haven't
4 found that exact document, but we did identify
5 a document written by Hap West, who was a Y-12
6 employee, that discusses the fact that the DOE
7 has accepted this database as the doses of
8 record for the workers. So it's one step
9 closer to that, but it's not the Holy Grail so
10 to speak, which would be a DOE memo stating
11 that. But it does support what we've been,
12 what we believe has been the case for this
13 database.

14 **DR. BEHLING:** Jim, this is Hans Behling. I
15 need to ask a question that refers to Table 6-
16 2 in your evaluation report. At the bottom --

17 **DR. NETON:** What page is that on, Hans?

18 **DR. BEHLING:** It's on page 26 and 27. And
19 let me just go to maybe 1954 as an example
20 that's on page 27 at least on my printout.
21 And the question I have is what constitutes a
22 record? You have a footnote A and then
23 there's a statement below that says fix on the
24 monitored records, include all currently known
25 available gamma, beta and neutron data. Does

1 a record refer to a single monitored
2 individual?

3 **DR. NETON:** No, I believe that that refers
4 to in the urinalysis section a number of
5 bioassay samples.

6 **DR. BEHLING:** Well, there's also for
7 external radiation which I assume involves the
8 assignment of dosimeters.

9 **DR. NETON:** Right, now external is a little
10 different issue because as I mentioned, and
11 someone from the ORAU side correct me if I'm
12 wrong here, but we do not have in many cases
13 the individual readings in the electronic
14 database. They have been consolidated into
15 quarterly results so we would not necessarily
16 have the bi-weekly reads that went in to make
17 that quarterly result.

18 **DR. BEHLING:** Well, I guess the question I
19 have if I'm looking at 1954, you have here a
20 total of 1240 records representing 682
21 monitored individuals. And I guess if I were
22 to believe, for instance, under one condition
23 the definition of a record is one individual
24 dosimeter assigned to one individual person,
25 that would constitutes only two records for

1 the 680, for each of the 682 individuals
2 monitored. And that's a period of time when
3 people were monitored on a weekly basis or
4 cycles were weekly. Which means that in
5 theory if I was looking at perhaps a complete
6 record for those 682 individuals, I would
7 expect somewhere close to over 35,000 records
8 to make it a complete record. And right now
9 I'm looking at this and saying is this really
10 a representation where only two records on
11 average for each individual was available for
12 reconstructing these doses?

13 **MR. TANKERSLEY:** (Inaudible) the year and
14 the quarter of monitoring. They summarized
15 those numbers and those are the official
16 recognized by DOE results. And of course, the
17 CER database is simply a copy thereof, and so
18 what as, the gentleman was, the example that
19 he was referring to, that would indicate that
20 those 600 and some-odd people, they would have
21 two quarterly records for each one and which
22 again is perfectly possible.

23 Some people would have all four
24 quarters; some people would have one quarter;
25 some people could have two quarters. So the

1 data and a record is a quarterly external
2 monitoring number even though that number
3 originally may have come from multiple weeks.
4 And that's all been explained and documented
5 perfectly in the health physics reports.

6 **DR. BEHLING:** And the reason I say because
7 I'm looking at another TBD. I'll tell you
8 which one. It's Paducah, and I'm looking at
9 the health physics reports there. And what
10 I've come to conclude is really that people
11 were being badged on a rotational basis. And
12 I think this brings us back to the issue of
13 the question that has been raised previously
14 where we, or at least I had mentioned perhaps
15 the concept of cohort badging.

16 And now I'm beginning to believe that
17 I'm looking at something very differently. In
18 other words, a person among the 682 people may
19 have been monitored during that year but not
20 on a weekly basis. In other words, if you
21 were person number one among the 682, you may
22 have only been monitored out of the 52 weeks
23 that you may have been employed there only a
24 fraction of the number of weeks in total
25 meaning that you really have incomplete

1 records on individuals.

2 And therefore, you may have a very
3 different understanding of what the average
4 doses were at least that's been my tentative
5 conclusion regarding Paducah gaseous diffusion
6 plant which also badge people up until 1960 on
7 a sampling basis, and thereafter again all
8 workers were monitored. So there's a real
9 parallel here, and I'm wondering if I'm
10 looking at the same thing here to Y-12.

11 **MR. TANKERSLEY:** I can't speak to the
12 records at Paducah, at least not right now,
13 but there's no evidence whatsoever, neither
14 written nor in the records, to indicate there
15 was any kind of random monitoring, and that's
16 what you're suggesting.

17 **DR. BEHLING:** Yeah, for Paducah there's no
18 question because I've looked at the health
19 physics reports and then, for instance, I'll
20 give you the numbers for 1953. Supposedly 223
21 people were monitored, and the assumption is
22 that they were monitored for each and every
23 week. As it turns out I'm looking at the
24 health physics records similar to the ones
25 that you're referring to here. And it turns

1 out that for some weeks there were only 32
2 badges issued meaning that clearly that the
3 people were not monitored for each and every
4 consecutive week throughout the whole year.
5 And it's likely that they were monitored on a
6 rotational basis, which completely changes the
7 whole landscape for the dosimetry data that
8 has been assembled in behalf of Paducah. And
9 it's possible that the same thing happened
10 here.

11 **MR. KERR:** Isn't the topic of Y-12?

12 **DR. NETON:** Yeah, Hans, I hear what you're
13 saying, and I don't know that it's relevant to
14 Y-12. Like Bill spoke, we have no indication
15 that this was the case, and in fact, I would
16 not be surprised if there were certain
17 campaigns going on in the facility where
18 (unintelligible) were being shipped or some
19 operation was being processed where workers
20 would be badged in some periods and not
21 others. That would speak as well to the, you
22 know, monitoring the highest exposed
23 individuals.

24 **DR. BEHLING:** Yeah, as I said, I just see a
25 tremendous parallel here between the time

1 periods during which part of the workers were
2 monitored and then thereafter. And whether
3 it's for Ames, I mean not for Ames, for Iowa
4 Army Ammunition Plant, Y-12, Paducah, the
5 transition between a partial worker monitoring
6 program to all worker monitoring program all
7 came in 1960 and '61. And so there must have
8 been some kind of a AEC policy shift that says
9 we must monitor everyone. And so there does
10 seem to be a parallel between different
11 facilities even though they were run by
12 different contractors.

13 **DR. NETON:** All I can say is maybe you have
14 not been on previous working group calls, but
15 we've gone to some lengths to support this
16 conclusion. I mean, we didn't make this up.
17 We heard this originally from interviewing the
18 health physics staff who indicated that this
19 was the case that the highest exposed workers
20 were monitored. We found documentation to
21 support that, and in addition, an analysis was
22 done with when all workers were monitored
23 versus some workers were monitored. And the
24 highest exposed workers continued to be the
25 highest exposed workers. It wasn't like it

1 shifted. So there's a three-pronged analysis
2 that we've done that we believe supports
3 fairly well that conclusion.

4 **DR. BEHLING:** Yeah, I don't doubt that
5 highest potentially exposed people were
6 monitored, but I still believe based on the
7 information I've seen for Paducah and possibly
8 here, too, that people were, in fact, still
9 monitored on a rotational basis meaning that
10 the same worker wasn't always monitored
11 throughout the year.

12 And that would be consistent with the
13 concept of cohort badging meaning that we want
14 to be sure that no one exceeds the regulatory
15 limit of 300 millirem in any given week or the
16 quarterly or the yearly limit. And the way to
17 do it is to basically monitor on a rotational
18 basis all workers at least for a fraction of
19 the year.

20 **MR. GIBSON:** This is Mike Gibson. I just
21 want to make a statement for the record here.
22 As an ex-DOE worker, I can state unequivocally
23 -- I don't know about Y-12 -- but I do know at
24 Mound that the potentially highest exposed
25 worker was not the one that was monitored in

1 all cases. It was the one that volunteered to
2 wear the dosimeter if they was going to have a
3 limited number of people that were badged or
4 monitored or whatever. So I can't speak for
5 Y-12. I have no knowledge of it, but I can
6 tell you you can't state unilaterally that
7 that was the case complex-wide.

8 **DR. BEHLING:** Maybe this is an issue that
9 needs to be resolved on another level other
10 than a conference call, but I will be writing
11 a draft report in behalf of our review of the
12 Paducah TBD. And I will provide some
13 information that supports my contention. Now
14 whether or not this particular issue applies
15 to Y-12 is something that we'll have to look
16 at.

17 **MR. GRIFFON:** And I think as it pertains to
18 Y-12, or if it pertains to Y-12, we, the work
19 group or the Board has asked SC&A to review
20 this evaluation report. And if you consider
21 all of the supplemental materials that have
22 been produced through the work group process
23 by, as Jim mentioned, they'll come to a
24 similar conclusion, then we'd appreciate
25 seeing their analysis and your review. I

1 think that's the place to expand on it.

2 **DR. BEHLING:** Yeah, at this point I really
3 just wanted clarification on a definition of
4 what constitutes a record.

5 **MR. KERR:** Excuse me; this is George Kerr.
6 We have some memos from Y-12 about who was
7 being monitored and for what periods.
8 Rotational monitoring was not used at Y-12. I
9 can clearly state that. I can clearly state
10 the highest exposed workers were being
11 monitored. They did have what was called a
12 supplemental badge program where they would
13 badge workers for a quarter or two quarters to
14 make sure that they weren't missing any highly
15 exposed workers.

16 If those workers showed that the head
17 load exposure sometimes in the supplemental
18 badge program, then they didn't monitor them.
19 They switched over; they monitored some other
20 workers. But there was no set rotational
21 badge monitoring at Y-12.

22 **MR. GRIFFON:** George, are these memos part
23 of the materials we have?

24 **MR. KERR:** Yes, sir.

25 **MR. GRIFFON:** They're all out there for our

1 review.

2 **MR. KERR:** They're on the O drive.

3 **DR. MAURO:** This is John Mauro. I have a,
4 just a point of clarification so I can
5 understand. Going back to the Table 6-2 that
6 Hans is describing, and we'll use the 1954
7 data. I just want to make sure I understand
8 now. What we have here is, you have 1,240
9 records and 682 individuals monitored. The
10 implication being on average, and each of
11 these records represents one quarter as
12 opposed to one week, that means on average any
13 one individual may have been monitored where
14 you have real data for him now for two
15 quarters. And the other two quarters on
16 average again the individual would have no
17 monitored record.

18 When you reconstruct that individual's
19 exposures for the time periods or the quarters
20 where you have no records, is that when you
21 would apply your extrapolation technique or
22 would you assume a zero reading for that
23 quarter or one-half the MDL?

24 **MR. TANKERSLEY:** I'm sorry, John, this is
25 Bill Tankersley again. I think one thing that

1 you would need to keep in mind is that while I
2 can't argue with the averages that you
3 calculated there, 1200 is very close to twice
4 what 600 is, but that's not really the picture
5 that one sees. One sees that typically a
6 group of people have four quarters of
7 monitoring because they are the regular
8 workers, the workers in one of the areas that
9 have a high potential for exposure. And then
10 there'll be another set of people that will
11 have, you know, will be monitored for one
12 quarter or two quarters and so forth as the
13 need arises for these short-term, some of the
14 projects were very short termed, and they
15 would need to wear a badge for those periods.

16 **DR. MAURO:** And for an individual worker
17 that situation would be apparent so in that
18 circumstance for the quarter that that person
19 was monitored, of course, you have his record.
20 And for those quarters that that person was
21 not monitored you would deal with that on a
22 case-by-case basis based on that individual's
23 work history. I just want to understand how
24 you fill in the missing data for that
25 individual whether you assume it's zero or you

1 use your extrapolation technique.

2 **MR. TANKERSLEY:** I cannot answer that. The
3 dose reconstruction people, maybe Jim can
4 address that.

5 (no response)

6 **MR. TANKERSLEY:** Since they are not, our
7 contention is that a person that is not
8 monitored for a quarter or a longer period --

9 **DR. NETON:** I'm sorry, Bill, it certainly
10 wouldn't be zero, and I'm at a loss. I don't
11 have the procedures in front of me, but I
12 assume that we would either impute the value
13 based on the back extrapolation or --

14 **MR. SMITH:** Jim, this is Matt Smith in
15 Richland. And you're absolutely correct. We
16 would follow Implementation Guide 001 which we
17 do not have dosimetry data bound the hierarchy
18 which includes coworker data which is the data
19 that George Kerr and Company has put together
20 in OTIB-0013 and also in Procedure 42.

21 **DR. BEHLING:** And this is Hans Behling
22 again. I guess the bottom line of my line
23 questioning really centers around the table
24 that's identified in TIB-0013 that says how
25 did these numbers come to be in light of the

1 fact that you may have people who were
2 monitored but not for all cycles of the year.
3 How did these numbers that are found in TIB-
4 0013 that now constitute the basis for cohort
5 dose assignment, how were those numbers
6 derived? And that's really the bottom line of
7 my question.

8 **MR. SMITH:** Well, again I'll turn you toward
9 George Kerr, but they wrote up, recorded the
10 report 32. Is that correct, George?

11 **MR. KERR:** Yes, and we handed out something
12 at the last meeting in Cincinnati that was a
13 progress report that very clearly tells you
14 how we got those numbers in the beta and gamma
15 regression analysis. It's very clear in there
16 what we did.

17 **MR. SMITH:** And I also see it now in this
18 SEC report as well. It's in the report and,
19 or the attachments rather. So I believe the
20 story's there.

21 **DR. NETON:** Right, and I believe SC&A did an
22 analysis of those 147 workers a month or more
23 ago and the report that I read based on
24 urinalysis didn't indicate any real issues I
25 didn't think.

1 **DR. BEHLING:** Well, Jim, this is Hans again.
2 We didn't approach it from that point of view.
3 We just looked at the continuity between pre-
4 and post-'61 as a timeframe for those 147. We
5 never really looked at the issue as we're
6 discussing it right now.

7 **DR. NETON:** Right, but then the most recent
8 reincarnation was last time when we were
9 discussing whether how could all those people
10 have zeros, and that was the argument against
11 this highest worker being badged. And I think
12 we discussed that and put that issue to bed by
13 indicating that a lot of the people were
14 monitored for potential exposure to beta
15 activity, not gamma activity.

16 **DR. BEHLING:** Yeah, in fact, I was the
17 person who wrote that memo that you are
18 referring to. On the other hand, I also look
19 at the beta-gamma ratio, and in truth, when
20 you look at the MDL values for beta and gamma,
21 if you have a zero gamma, you have close to
22 zero beta as well so the two really go hand-
23 in-hand.

24 **MR. GRIFFON:** I think, again, I think
25 there's several issues here, and I think some

1 of those reports that were provided I'm not
2 sure that SC&A completely reviewed them. But
3 I'm assuming in your review of this evaluation
4 report, you'll roll up any outstanding issues
5 on this topic.

6 I mean, I'm listening here, Jim, and
7 one thing that I'm thinking of, you know, just
8 assuming that taking the position that the
9 highest exposed individual was monitored, some
10 things that have been said raised the question
11 in my mind about sort of dilution of the
12 distribution. You know, that there were these
13 supplemental people badged and that data is in
14 there, but when you add all this data in
15 together, you know, what is your distribution
16 representative of?

17 Your distribution is also based on
18 quarterly results, and those quarterly may
19 well be 13 weeks, but then maybe one week for
20 an individual I guess is what I'm hearing. So
21 interpreting that, that coworker distribution,
22 I think is more, you know, may not even now be
23 down to a question of what the most highly
24 exposed person monitored but rather just how
25 is the coworker model being interpreted and

1 used for filling in the blanks for people
2 without data?

3 **DR. NETON:** I think there was some conscious
4 effort on our part to fit these 147 workers.
5 I'm sure George Kerr would agree to that.
6 These were not randomly selected folks. I
7 don't know. I wasn't prepared to go down this
8 whole path again or I would have re-read all
9 those reports.

10 **MR. GRIFFON:** I also think you've provided a
11 lot of, you know, you've given us those
12 reports, and I think we ought to re-examine
13 those is what I'm saying.

14 **MR. KERR:** Let me make a comment, please.
15 This is George Kerr. We very carefully went
16 in and selected 147 workers who had
17 significant amounts of monitoring data to do
18 the regression, and obviously, if these people
19 had a lot of records, they were, had some
20 highest exposures to gammas. So this wasn't
21 going in and just selecting people at random.
22 And also we did the beta regression. We went
23 in and selected a set of people who had a
24 significant number of orders of beta exposure
25 data. And that was what we were looking for

1 to do in regression analysis. We think this
2 is a claimant-favorable estimate for the
3 population as a whole. For the people it
4 doesn't provide a claimant favorable, there
5 are ways to scale the data up to make it
6 claimant favorable. So I don't see how we
7 missed anything important in here.

8 **DR. NETON:** Everyone needs to go back and
9 refresh their memory I suppose on what these
10 reports have, but I do think that they are
11 fairly good scientific treatments of the
12 issue. And I don't know that we have the kind
13 of holes that are being suggested at this
14 point.

15 **DR. MAURO:** This is John Mauro. I think --

16 **MR. GRIFFON:** I think it's more
17 clarification, Jim, than suggesting that
18 there's holes, but anyway, go ahead, John.

19 **DR. MAURO:** Jim and Mark, this is John
20 Mauro. Jim, I agree, you folks have invested
21 a tremendous amount of research and analysis.
22 I was party to the last meeting. You provided
23 us with a great deal of material and a lot to
24 think about. We have all that material, and I
25 think really the ball is in our court now to

1 digest it and to convince ourselves that, in
2 fact, of the virtue of your position. But we
3 do need to, we're still looking at it. And I
4 presume at some point we will be asked to
5 prepare our findings and observations
6 regarding this matter that we will deliver in
7 draft form to the working group.

8 **DR. NETON:** I appreciate that, John. I
9 guess what I'm asking at this late juncture
10 though is that when analyses are done, they
11 don't come sort of out of left field and say
12 this could have been like Paducah but point
13 specifically into why the technical analyses,
14 and there's hundreds and hundreds of pages
15 that we've put together, are incorrect or
16 inappropriate. Because otherwise then we end
17 up just re-issuing the document again and
18 saying, well, here's where we addressed this.
19 So it would be great for us if we would, you
20 would couch these discussions in the context
21 of what we have out there in addition to what
22 you might have found yourself. But if you
23 follow my --

24 **DR. MAURO:** Jim, I agree with you a hundred
25 percent. We will do the best we can to

1 crystallize places where, if there are areas
2 where we disagree, the basis for that
3 disagreement, we will try to make it as clear
4 as possible so to put the working group and
5 the Board into a position to appreciate
6 exactly where we agree to disagree, and then,
7 of course, somehow that might need to be
8 resolved. I'm not saying that's where we're
9 going to come out on this, but we're going to
10 do our best to try to put a nice clean
11 boundary around areas where we agree, on areas
12 where we disagree and why so that the Board
13 will be in a good position to make a judgment.

14 **DR. NETON:** That's fair enough, John.

15 **MR. GRIFFON:** Jim, can I --

16 **DR. NETON:** I just wanted one more question
17 though. At one point we had come to the
18 conclusion that whether the highest exposed
19 worker was badged or not, which we still
20 believe is a solid position, that it was
21 really a matter of whether you picked the 50th
22 or the 95th percentile, the distribution
23 applied to unmonitored workers.

24 **MR. GRIFFON:** I was just actually going to
25 offer the same. That it may at the end of the

1 day being a site profile issue more than a,
2 you know, a --

3 **DR. NETON:** Well, right, so if that's the
4 case, we've got a lot of other issues to deal
5 with.

6 **MR. GRIFFON:** I think, my sense, Jim, is
7 that you've provided plenty of analysis on
8 this topic and at this point it's in SC&A's
9 court. And we have asked them to do a review
10 of this evaluation report. And the evaluation
11 report references those analyses. So that's
12 part of the process, they have to review. And
13 I think we wait for their final product on
14 that.

15 **DR. NETON:** Right, is this an SEC issue or
16 not?

17 **MR. GRIFFON:** And if they, I would assume,
18 John, that if you look at this and you still
19 have some certain concerns, but you say,
20 however, I mean, certainly, it's within their
21 purview to say however, we don't believe it's
22 an SEC issue. We believe it could, a dose
23 could still be calculated, et cetera, et
24 cetera. So I think that could be handled that
25 way and SC&A's write up if appropriate.

1 **MS. MUNN:** This is Wanda. I thought we had
2 sort of put that to bed, and that it was going
3 to be considered a site profile issue.
4 Perhaps I misunderstood what the discussion,
5 where the discussion was going earlier.

6 **DR. MAURO:** This is John Mauro. I would
7 take responsibility for the situation we're in
8 right now. At our last meeting, conference
9 call, I did make a very sincere statement that
10 in my opinion we were dealing with a site
11 profile issue. However, I also apologize to
12 the working group because by no means did I
13 mean to pre-empt the working group and its
14 judgment regarding this matter. And so as a
15 result of that I have made my opinion known,
16 but I think we certainly need to put our
17 material in our report, our recommendations
18 and findings to the working group, and of
19 course, ultimately it will be the working
20 group's judgment as to whether or not, not
21 withstanding the outcome of this debate,
22 whether or not there's a debate here that has
23 any relevance to the SEC.

24 **MS. MUNN:** Oh, yeah, I didn't feel you were
25 pre-empting anything, John. It was just my

1 understanding from the previous discussion was
2 that we had sort of --

3 **MR. GRIFFON:** My sense was, at least from
4 the action standpoint, I did leave that one
5 open kind of, Wanda. I do remember John's
6 point, and I think we were kind of leaning
7 that way, but we also at the last conference
8 call had just received that lengthy addendum
9 that George put together for us. And I
10 thought it was a little hasty to just, you
11 know, I think I was trying to give SC&A a
12 little more time to assure themselves of the
13 position on that so I left it open at this
14 point. But I think it does have to be wrapped
15 up in the final review and if it's not, you
16 know, if it's a site profile issue, it should
17 be stated that way in your review, John, you
18 know, if there's still some concerns but you
19 believe they're fully or clearly not SEC
20 issues then I think you should state that so
21 that we don't have to consider it in these
22 deliberations over the SEC petition.

23 **MS. MUNN:** I guess I did misunderstand then
24 what your position was, Mark. I guess I am
25 concerned about the time constraints we have

1 here. And I guess the issue in my mind now is
2 how soon the working group can resolve this
3 particular point so that we can get it before,
4 we can get our final comments before the Board
5 for their action. Do you, what are we looking
6 at in time here?

7 **MR. GRIFFON:** That's a good question. I
8 would, I think we really do need a review of
9 this evaluation report by SC&A prior to the
10 Board, you know, to the work group prior to
11 bringing this to the Board for full
12 deliberation and consideration, but I'm not
13 sure --

14 **MS. MUNN:** We need for us to be able to do
15 this in Denver.

16 **MR. GRIFFON:** Yeah, I know, and looking at
17 the clock I'm not sure what this means, but
18 John, do you have any sense of how long --

19 **DR. MAURO:** Yeah, I was giving some thought
20 to that. My main concern is the example
21 problems. That is, we certainly have had an
22 opportunity to read the evaluation report, and
23 we understand it. But as we read it we also
24 realize that the evaluation report reads very
25 much like a road map. To issue making cross-

1 reference to a number of sections of the site
2 profiles, to many OTIBs.

3 And in the end the rubber meets the
4 road with the example problems. And it was
5 our intention to go through the example
6 problems and go through the roadmap so to
7 speak and say, okay, I see how they're dealing
8 with the exotic radionuclides. Oh, yes, I see
9 exactly how they plan to use the data for back
10 extrapolation in this particular example, the
11 neutrons, et cetera, et cetera.

12 And it looks like that there are six
13 cases, where I'm going with all this is I
14 think it's very important that SC&A go through
15 the example cases and come to our own sense
16 that, yes, it looks like they not only have
17 written up an evaluation report that addresses
18 all the issues, they've also provided us with
19 examples demonstrating that, yes, in fact,
20 they can reconstruct the doses and address all
21 the issues that were at play. That last part,
22 going through the example problems, I'm not
23 quite sure how time consuming that's going to
24 be. Quite frankly, I'm going to sort of put
25 Hans on the spot.

1 Hans, as you know, has been leading up
2 all of what I call the case reviews. And for
3 all intents and purposes what we're talking
4 about is reviewing six cases.

5 **MR. GRIFFON:** Not quite though, I think
6 these are not full DRs in that sense, so
7 you're looking at theoretical DRs I think.

8 Jim, am I correct in that?

9 **DR. NETON:** Yeah, that's right, Mark.

10 **MR. GRIFFON:** You're looking at proof of
11 principle for certain aspects of the dose
12 reconstruction.

13 **DR. NETON:** These are much, I don't want to
14 say simpler, but more basic than a dose
15 reconstruction. A proof of principle is the
16 right term.

17 **MR. GRIFFON:** And I don't think it's a
18 matter of cross-walking with the original
19 records and all that time consuming stuff done
20 in a normal audit.

21 **DR. NETON:** That's correct, but there will
22 be some interpretation required when one says
23 we use -- and Hans is probably in the best
24 position to make that determination. We, you
25 know, assign the triangular distribution per

1 this procedure. And that's some of the stuff
2 that's in those examples that I provided last
3 night.

4 **MR. GRIFFON:** Yeah, I don't want to
5 underestimate the time consumed.

6 **DR. MAURO:** I hear what you're saying, Jim,
7 and I agree. In other words what you're
8 saying is we don't really have to match every
9 number. What we need to do is to convince
10 ourselves that you have in place a protocol
11 that will allow you to get to a number and
12 that that protocol, in fact, is based on data
13 and assumptions and models that seem
14 reasonable without actually going that extra
15 yard and actually matching the number. So I
16 agree, the evaluation of your case is probably
17 is a simpler process than a typical audit of
18 cases.

19 **DR. NETON:** One thing I might caution you
20 though is that we, the ones that we put over
21 were really ones that are proof of principle
22 that we can do dose reconstructions that are
23 plausibly bounding. In other words we, you
24 know, for dose reconstructions as far as SEC
25 determinations go, we have to be able to

1 demonstrate that we can bound the upper limit,
2 but we also are aware that that upper limit
3 has to be a plausible number.

4 And that's really what we tried to put
5 out there, and, you know, I'd appreciate
6 feedback on it if they're not hitting the
7 mark. I know they came out fairly late in the
8 game, and I apologize for that, but we're open
9 for discussion on these. And maybe that's
10 where us, SC&A and NIOSH, can work together to
11 get these examples fine-tuned in a quicker
12 fashion.

13 **MR. GRIFFON:** Given all this, John, and the
14 time we have, I mean my hope was that we could
15 get a review from --

16 **DR. WADE:** Mark just went away. Mark,
17 there's an awful lot of static on your end.

18 **MS. MUNN:** It's unhearable. I'm assuming
19 that's Mark's phone.

20 **DR. WADE:** Maybe they'll take steps to
21 rectify the problem. Mark, we can't hear you.
22 Let's give him a minute.

23 **MS. MUNN:** Give him time to get to another
24 phone.

25 **DR. WADE:** Yeah, I think it's happened

1 before. He's recognized it and come back to
2 us.

3 Are you back with us, Mark?

4 **MS. MUNN:** My hope is he's hung that one up
5 and gone to another phone to call back in.

6 **DR. WADE:** Well, who's on the line? Mike,
7 are you still there?

8 **MR. GIBSON:** Yeah, I'm still here.

9 **DR. WADE:** And Wanda, you're there. Let's
10 give Mark a minute just as he was about to say
11 something profound.

12 **MS. MUNN:** In the interim, John, thank you
13 for sending the, that dose reconstruction
14 example.

15 **DR. MAURO:** Okay, thank you. I had only had
16 five, I believe, but we've been talking about
17 six, so I may have missed one.

18 **MR. GRIFFON:** Hi, it's me back again. I've
19 got to pay the phone bill. My portable went
20 dead there. I hope I didn't blow everybody
21 out with the static.

22 Well, I don't know what was said, but
23 I was hoping that SC&A could provide a review
24 before the next meeting, at least maybe a day
25 or two. To be fair I think that's the best we

1 can expect, given it's about two weeks away.

2 **DR. MAURO:** Yeah, Mark, let me say this.
3 We're going to hit this with everything we
4 have, the Y-12 cases. And what we will do is
5 we will start moving through each of the cases
6 and the issues that are in play, and we will
7 stay in continual touch with you as we move
8 through the process. It may turn out we can
9 move through it expeditiously and deliver a
10 report or at least some findings and
11 observations regarding these matters to the
12 working group, and we could even hold some
13 discussions before the meeting.

14 But I hate to make that type of
15 commitment because we haven't even looked at
16 the example problems yet. But we will be
17 doing that immediately and we will say within
18 a matter of a day or two we should be in a
19 better position to start to let you know how
20 our position's going to be by the time we're
21 ready for the meeting on the 24th.

22 **DR. MAKHIJANI:** This is Arjun. I have a
23 question about the dose reconstructions and
24 the maximum plausible doses which is I kind of
25 quickly scrolled through the Word documents

1 summarizing the dose reconstructions at the
2 break, and I didn't see that there was a
3 discussion in any of them -- I might easily
4 have missed it -- of how this overlaps with
5 the proposed class. Whether these workers,
6 for instance, in the number five case which is
7 a uranium dose reconstruction and the person
8 was in 92-12, what you do about potential
9 thorium exposure at, how does the uranium and
10 thorium exposure overlap?

11 **DR. NETON:** Well, Arjun, you might have
12 missed it, but we're proposing to add workers
13 who were exposed to thorium to this class so
14 we're not doing thorium exposures.

15 **DR. MAKHIJANI:** No, no, no, I understand
16 that. The, no, but I guess I don't know how
17 to ask the question right. If the class
18 consists of people who are thorium workers,
19 who were, presumably who were dealing present
20 in these buildings and some of them were also
21 exposed to uranium or they were maintenance
22 workers. I don't understand how you deal with
23 the overlap. Who's in the class?

24 **DR. NETON:** That's two kinds of questions.
25 I think depending on, I guess, the view point,

1 we believe we can do uranium dose
2 reconstructions for all workers. That's our
3 position at least. Now how a thorium worker
4 gets added is a little more problematic and
5 that's an SEC class definition issue, but one,
6 we'd have to establish that these people
7 worked in those buildings and had the
8 potential to be exposed to thorium.

9 We don't necessarily make that
10 determination from our end. We are in the
11 position of defining what we cannot
12 reconstruct. And that's where we ended up.
13 But we will reconstruct all uranium exposures
14 for anyone who has not been determined to be a
15 thorium worker.

16 **DR. MAURO:** This is a good discussion. Let
17 me, let's say we're going through the
18 examples, and we say, okay, we agree that this
19 example demonstrates the methodology for
20 reconstructing the doses to uranium or some
21 internal emitter, other internal emitter or an
22 external exposure. But let's say we're
23 talking about a real person now. But we have
24 no way of knowing whether this real person
25 that we're looking at did, in fact, was, in

1 fact, exposed to any thorium.

2 And so in a funny sort of way our
3 review of your cases may very well come out
4 something like this. Yes, we see the approach
5 you've done. We believe you can reconstruct
6 the doses to exposures to uranium or many of
7 these other radionuclides that we've been
8 talking about. But we don't know whether or
9 not this particular worker was exposed to any
10 thorium. And so we really can't say whether
11 or not the reconstruction for that worker is
12 complete. How do we deal with that?

13 **DR. NETON:** I'm not sure, John. I mean, is
14 Larry Elliott on the phone?

15 **MR. ELLIOTT:** I am on the phone.

16 **DR. NETON:** Larry, can you help me out here
17 because it's my understanding that we don't
18 make the determination.

19 **MR. ELLIOTT:** That's right, this is an
20 aspect of development of a claim that
21 Department of Labor conducts as they do for a
22 congressionally established SEC sites, and we
23 have vetted our definitions on the Y-12, Rocky
24 Flats and the Ames with the Department of
25 Labor. And they have commented that they

1 understand the definitions as proposed and
2 feel that they can have the wherewithal to
3 develop the claims to put the people in the
4 class or find them not to be included in the
5 class.

6 **MR. GIBSON:** Larry, this is Mike Gibson. So
7 if I could just try to understand what you're
8 saying. On page 11 of the evaluation report
9 for Y-12 there's a Table 4.1, Y-12 claims
10 submitted for thorium, Y-12 claims submitted,
11 and it says '96. Is that all the workers that
12 have filed claims or is that only the workers
13 that I guess you're saying DOL thinks --

14 **MR. ELLIOTT:** Four point one and the '96
15 total claims that you see listed in that table
16 are claims that we have in our possession here
17 at NIOSH for dose reconstruction that have
18 time in the class period.

19 **DR. NETON:** Larry, can I help you out a
20 little bit though? I think what's happened is
21 this table is in error actually. That number
22 was for the original class petitioned by --

23 **MR. ELLIOTT:** Oh, that the petitioner
24 submitted?

25 **DR. NETON:** Yeah, and so in reality that

1 table should be revised to include what we're
2 calling now our proposed class. So I
3 apologize for that error, but I noticed that
4 this morning and meant to point it out.

5 **MR. ELLIOTT:** I didn't catch that either,
6 but the footnote calls for the time period of
7 the class.

8 **DR. NETON:** It's the right time period and
9 everything but --

10 **MR. ELLIOTT:** But be that as it may, you
11 know, the numbers that would be in this table
12 if they were correct would only be the claims
13 that we know we have in our hands that have an
14 identified timeframe subject to the class
15 definition. We do not have the ability here
16 to develop the basis for whether a claim would
17 have the right cancer type, latency and
18 duration of exposure or duration of time in
19 the class period to be included in the SEC
20 class.

21 **MR. GIBSON:** This is Mike again. So it's,
22 it is limited to those that you think meet the
23 criteria, not the total number that are
24 submitted or have filed claims?

25 **MR. ELLIOTT:** Once we get this table right,

1 whatever that number will be, will be for the
2 claims who have time in the period of the
3 class.

4 **DR. NETON:** I can put a little light on
5 that. We believe that there are about 850
6 people that have time in that class. Well,
7 not in the thorium class, but in the total
8 people who have worked between in the SEC time
9 period that were not already eligible based on
10 the first, you know, the initial Y-12 SEC. So
11 there would be about 850 total claimants
12 eligible for cases, eligible to be considered
13 as thorium workers I think is the way.

14 **MR. ELLIOTT:** And to take that further then
15 the Department of Labor will take those
16 claims. We give the Department of Labor a
17 full list of those claims, and they would then
18 develop whether that individual claim was a
19 thorium worker or not.

20 **MR. GIBSON:** This is Mike Gibson again just
21 as a follow up. So I'm still just trying to
22 determine how you make the definition, you
23 know, for instance are you including
24 maintenance workers? Because they usually
25 typically rove all over the plant. So I mean,

1 are they included in that or --

2 **DR. NETON:** If the maintenance worker was
3 monitored or should have monitored for
4 exposure to thorium, yes.

5 **MR. ELLIOTT:** If the maintenance worker
6 frequented these buildings listed in the
7 definition and should have been monitored or
8 was monitored for thorium, yes, they would be
9 in the class.

10 **MR. GIBSON:** So are there records in the
11 database to show which buildings they worked
12 in or --

13 **MR. ELLIOTT:** Well, your question goes to
14 the way that DOL develops the eligibility of a
15 claim for the class, but I can't speak to that
16 although I know that other than I know they
17 use affidavits; they use records that are
18 available to them to assess whether the
19 individual claim fits into the class. Our
20 basis, our evaluation report is to provide a
21 scientific basis on whether or not we can
22 conduct dose reconstruction to a sufficient
23 level of accuracy and whether or not then, if
24 not, was health endangered. That's what we're
25 required to do, and that's what we've

1 attempted to do in this evaluation report.

2 **MR. GIBSON:** Right, I understand that,
3 Larry. This is Mike again. I'm just saying
4 I'm trying to determine how you or how DOL
5 determines if people should have been
6 monitored for thorium. That's all I'm saying.

7 **MR. ELLIOTT:** Well, I don't know if Jeff can
8 help us out if he's still on the phone. But
9 they do this for the existing congressional
10 SECs which have similar language, should have
11 been monitored or were monitored.

12 **MR. GIBSON:** Okay, and I'm not trying to be
13 argumentative --

14 **MR. ELLIOTT:** No, I understand.

15 **MR. GIBSON:** I'm just saying to be claimant
16 friendly and I know you can only go just back
17 and get the records you can get, but it's just
18 if they don't exist, you know, it just doesn't
19 seem, I don't know. Is Jeff Kotsch on the
20 line? Could he speak to this issue?

21 **DR. WADE:** Either Jeff isn't on the line or
22 doesn't wish to speak to that. Again, you're
23 asking an excellent question, and at a minimum
24 we'll ask our colleagues at DOL to come to the
25 Board meeting prepared to answer this

1 question. Again, by statute this is not the
2 NIOSH responsibility. It is the DOL
3 responsibility, and it would be, I think,
4 wrong for us to try and categorize how they do
5 this. The best thing for us to do is to
6 invite them to come and brief the Board in a
7 complete way as to how they would go about
8 this activity.

9 **MR. GIBSON:** Okay, thank you, Lew.

10 **MR. GRIFFON:** Although to me, I mean, just
11 to follow up on Mike's line of questioning, I
12 mean I think to me this seems like I don't
13 know that there are any, there's no job title,
14 thorium worker, at Y-12.

15 **DR. NETON:** Yeah, I don't think, Mark, that
16 this intent is to call someone a thorium
17 worker. I think really --

18 **MR. GRIFFON:** Yeah, but I'm just wondering
19 if, you know, does DOL have enough information
20 to make this decision or does it, it would, I
21 think, count on NIOSH for some process
22 information on those various buildings and
23 those kind of things.

24 **DR. NETON:** Those all have to be worked out.
25 I think you're right, but I think the intent

1 here is that if, you know, to segregate out
2 people who have potential for exposure to
3 thorium versus someone who may have set a foot
4 in the building at one point to deliver a
5 piece of paper, I mean, one has to make some
6 cut points here, and how Labor does that, I
7 think Lew's right. They need to speak for
8 themselves, but --

9 **MR. GIBSON:** This is Mike again. Did I cut
10 you off, Jim? I'm sorry.

11 **DR. NETON:** No, no, that's fine.

12 **MR. GIBSON:** I wasn't just limiting this to
13 thorium, I was just getting to the in general
14 for any radioisotope which I think is the
15 intendance of the act is exposure to any
16 isotopes so I don't want it to be defined as I
17 was just asking the question strictly about
18 thorium, you know, it's DOL or whoever makes
19 this decision. How do they base it on
20 exposure or unmonitored exposure to any
21 isotope?

22 **DR. WADE:** I'll see that we make the request
23 of our colleagues at DOL to come in and brief
24 the Board on this. Thank you, I think it's a
25 pertinent discussion. I don't think it's one

1 we can have the closure here, but I think it's
2 excellent that it was brought up. And we'll
3 work to see that there is information shared
4 with you. I mean, if NIOSH is in a position
5 to do its job, and that's what NIOSH is
6 presenting, what happens once that job is done
7 falls to another agency and we need to be sure
8 you understand that.

9 **DR. MAKHIJANI:** Dr. Wade, this is Arjun
10 Makhijani. So I presume that by the time a
11 case come to NIOSH one assumes that they were
12 not exposed to thorium in that period because
13 everybody else, the thorium-exposed people
14 have been already taken out of the
15 consideration or --

16 **DR. NETON:** Fundamentally, that's correct,
17 Arjun, except that we already have many of the
18 cases here. What will happen is the
19 Department of Labor will re-evaluate all the
20 cases that they sent to us and make a
21 determination of which ones we don't need to
22 proceed with dose reconstructions.

23 **DR. WADE:** Yeah, depending on how the
24 decision is made, once it's made there'll be
25 an awful lot of activity that we'll have to

1 happen to implement that decision. And we'll
2 attempt to brief you thoroughly, brief the
3 Board thoroughly on that at the next meeting.
4 In a way your decision is sort of independent
5 of that. Again, you have a responsibility to
6 act upon the proposal as it's brought to you
7 if your consideration in your opinion needs to
8 be informed based upon what DOL has to say.
9 Then we'll see that you have that information.

10 **MR. GIBSON:** This is Mike again though, you
11 know, not trying to belabor this, but just if
12 NIOSH gets the records and DOL makes the
13 determination and then turns around and comes
14 back to NIOSH, it's almost like a criteria
15 setup that would make an SEC impossible.

16 **MR. ELLIOTT:** This is Larry. DOL does not
17 come back to us for this kind of development,
18 and they're not seeking that job categories or
19 titles that we think fit into this class or
20 that we don't fit into this class.

21 **MR. GIBSON:** Right, I understand that, but I
22 mean you guys have the records, and then you
23 have a dialogue with DOL and then they come
24 back to you. And it just, in the back and
25 forth it just seems like it could basically

1 sabotage a legitimate SEC petition or criteria
2 if that makes sense.

3 **MR. ELLIOTT:** I guess your point's lost on
4 me. Certainly, if we have any records here
5 that speak to types of workers, job
6 categories, process information, rosters of
7 individuals who frequented buildings, we would
8 give that to DOL to help them make their
9 determination and make the developments as we
10 have done in the past. But I guess I'm not
11 clearly understanding the point you're trying
12 to make.

13 And I'm not trying to be
14 argumentative. I just want you to understand
15 that when it comes to responsibilities, this
16 is one that the Department of Labor takes
17 seriously, and it's their responsibility to
18 follow up on it. As Lew mentioned we'll make
19 sure that DOL is at the Board meeting to
20 provide an elucidative answer here.

21 **DR. WADE:** Maybe just as brief background,
22 Larry, I mean the issues of employment and
23 where an individual worked, those have always
24 been DOL judgments, not NIOSH judgments.

25 **MR. ELLIOTT:** That's correct, and when, for

1 example, when we identify additional
2 employment history in our development of work
3 histories, we transmit that information back
4 to DOL with the claimant's knowledge and
5 understanding that their claim will include
6 the additional employment history that we have
7 found. So the same would be true as we work
8 with DOL on moving claims through these
9 different classes that are being added to the
10 special exposure cohort.

11 **DR. WADE:** I'm sorry this is complex. It is
12 to us as well. But again, we'll see that, to
13 the degree we can make it happen, as clear an
14 explanation as possible is provided to you at
15 the next Board meeting.

16 **MR. ELLIOTT:** I mean, Mike or anybody, if
17 you'll look at the congressional-designated
18 classes to the SEC, you'll see similar
19 wording, were monitored or should have been
20 monitored. And DOL evidently from that, from
21 the genesis of this program have developed
22 ways and means to place people in those
23 classes based upon that language.

24 **MR. GIBSON:** But right, I understand that,
25 but -- this is Mike Gibson again. But it's

1 based on the data that NIOSH has that they
2 give to DOL to develop their opinion, right?
3 So --

4 **MR. ELLIOTT:** If we have data, we give it to
5 them, but not in all cases do we have data
6 that aids them in developing a claim fit into
7 the class.

8 **MR. GIBSON:** Okay, well, yeah, I think
9 that's kind of my point. The determinations
10 are based on data that's available to you.

11 **MR. ELLIOTT:** No, not in all cases.

12 **DR. MAKHIJANI:** Larry, this is Arjun. I
13 have a different kind of question. I mean in
14 the congressional-designated SEC classes, or
15 instance, if you take Paducah, the existence
16 and who worked, I mean, most workers worked
17 with recycled uranium. And you know, they
18 were monitored for uranium so there was an
19 overlap of the missing piece of information
20 with the existing piece of information. In
21 this case thorium was not the prominent
22 material being processed. And as you found,
23 there appear to be essentially no personal
24 data that have been located, no monitoring.
25 So no one was monitored in the period in

1 question. So since it was a minor
2 radionuclide whose extent of processing
3 doesn't seem to be very clear except that Mel
4 Chew said it was hundreds of kilograms, and
5 probably there's a document to that effect, it
6 seems a little bit more complicated and
7 difficult --

8 **MR. ELLIOTT:** Yes, I understand, and you are
9 correct. I'm sure it will be more complicated
10 and difficult than what DOL applies in the
11 congressional classes that were so designated.
12 But I think you will, you know, once DOL can
13 relate to you how they do this development
14 work, you know, for Paducah I know that there
15 are secretaries or administrative or clerical
16 folks that they exclude that they send to us
17 for dose reconstruction because those people
18 were not viewed as someone who had a job that
19 should have been monitored.

20 **DR. WADE:** Okay, well, this is a complex
21 issue, but it's an issue really of the
22 relative responsibilities at the different
23 agencies. NIOSH's judgment here is to
24 evaluate whether or not doses can be
25 reconstructed consistent with the language of

1 the rule, and that's a judgment we make. How
2 the administrative decisions to implement that
3 really fall with DOL, and we need to bring DOL
4 to the table to explain that to you so that
5 you can be again aware of that as you make
6 your progress.

7 **MR. GIBSON:** Lew, this is Mike again. If
8 I've got you right they'll be ready hopefully,
9 I know you can't speak for them, but what at
10 least I would like, I can't speak for the
11 Board, the definition of exposure is to any
12 type of radionuclide, not just thorium or
13 plutonium or whatever.

14 **DR. WADE:** I understand that. I mean, what
15 I'll ask them to do is to just come, send
16 someone knowledgeable who can come and talk to
17 us, explain to us, to you, how they go about
18 making these judgments, the generic approach.
19 And again, I can't promise that'll happen. It
20 is certainly something I'll set out to do on
21 your behalf. But again, it's not that we
22 understand this crystal clear and you don't.
23 I mean, this is, again, in this program every
24 time we turn a corner we discover, we are into
25 new territory and now we are again. And we

1 need to make this as clear as we can to you as
2 you go forward.

3 **MR. GIBSON:** Okay, yeah, thanks.

4 **DR. WADE:** Yeah, thank you.

5 **MR. GRIFFON:** Right, Jim, at this point are
6 you, you pretty much went through the
7 approach, right, in the evaluation report?

8 **DR. NETON:** Right. I'd just like to add one
9 more thing though. It was all really good
10 discussion. I think the discussion was
11 precipitated by John and I think Arjun wanting
12 clarification whether they needed to look at
13 these examples in light of the fact of can we
14 do thorium for these workers.

15 And I think what I'm hearing is that
16 the answer is no at this point. I mean, we're
17 defining the class as thorium workers and then
18 that falls under the Department of Labor. So
19 I just want to make sure. I think, I hope
20 we're all on that same page. That's what I'm
21 understanding anyways.

22 **MR. GRIFFON:** I think if I were in John's, I
23 think I would advise John to put that, you
24 know, we assume that the thorium was not
25 considered here and take that up as a separate

1 discussion.

2 **DR. MAURO:** Yeah, my understanding is we're
3 off the hook on that one. And we will just
4 look at the issues that are before us and
5 thorium is not one of the issues that we need
6 to look at.

7 **DR. NETON:** Right, okay, I just wanted to
8 make sure that we were all on that same page.

9 Okay, Mark, I pretty much outlined the
10 approaches for where we're, what we're doing
11 and --

12 **MR. GRIFFON:** What I was going to suggest is
13 maybe to quickly go through the matrix and
14 then get into the sample DRs if that makes
15 sense. And I don't know if people want to
16 take a break first or if this would be a good
17 time for Ray to get, I mean, if people want a
18 five-minute break and then start into the
19 matrix and the samples?

20 **DR. WADE:** Seems reasonable.

21 **MR. SMITH:** Before you go on a break this is
22 Matt Smith in Richland. I am going to ask one
23 of our staff, Steve Reed (ph), who is a dose
24 reconstructor on these to try to call in for
25 this part of the meeting for any external

1 dosimetry that may come up.

2 DR. NETON: That's fine, Matt.

3 MR. GRIFFON: And I'm hoping the matrix
4 section will only take a half hour or so. I
5 think we've hit on a lot of the points
6 already.

7 DR. NETON: I think you're right.

8 MR. GRIFFON: Go through for purposes of
9 completeness.

10 MS. MUNN: We were down to very few items
11 that --

12 MR. GRIFFON: Yeah, I highlighted in yellow
13 so I hope we can skip through this matrix
14 fairly quickly. So let's maybe reconvene at
15 3:00 p.m. eastern.

16 DR. WADE: Thank you.

17 MS. MUNN: I'm going to stay on the line.
18 (Whereupon, a break was taken from 2:55 to
19 3:00 p.m.)

20 MR. GRIFFON: Why don't we start. I'm sure
21 Mike will be on in a second.

22 **MATRIX DISCUSSION**

23 I was going to say just to go through
24 the matrix fairly quickly hopefully. And
25 looking down the first item I have is item

1 number two, and I think that this is all
2 rolled into Appendix 1, your response to this,
3 right, Jim?

4 **DR. NETON:** That's correct.

5 **MS. MUNN:** There was a point, I was of the
6 impression that they were covered and this is
7 now good to go, incorrect?

8 **MR. GRIFFON:** Well, I think that that's your
9 final deliverable on that item I believe,
10 yeah. That's what I would say. I think
11 you've responded to all the questions and
12 requests in that area.

13 **DR. NETON:** Correct, given the timeframe
14 available to us we've done as good a job as
15 we're going to get at this point, and it's
16 unlikely to change.

17 **MR. GRIFFON:** Right, okay, item three is
18 similar. I think it's also in that appendix.
19 Now there's no further information on
20 logbooks. Any more being done on the punch
21 card data, Jim?

22 **DR. NETON:** No, I think you heard Bill
23 Tankersley say that he was going to but time
24 did not allow for him to look at the punch
25 cards. I think that this calls for us to look

1 at, so I tried to identify punch cards in the
2 SEC period and we just have not been able to
3 do that.

4 **MR. GRIFFON:** But there's nothing, you know,
5 like work in progress. It didn't sound like
6 it.

7 **DR. NETON:** No, I think at this point we've,
8 you know, our report stands as it is.

9 **MR. GRIFFON:** And then item six, we might
10 want to slightly amend that to say that you
11 have this Hap West report, correct?

12 **DR. NETON:** Correct. I will get that on the
13 O drive as soon as possible.

14 **MR. TANKERSLEY:** Is that that document now
15 resides on the O drive?

16 **DR. NETON:** Bill, it's actually on your O
17 drive, but not the one that I can access. So
18 we need to get together and figure out where
19 it goes. If you send it to me, I'll put it
20 out where I know I can, I've been doing it.

21 **MR. GRIFFON:** Bill will have to take care of
22 that.

23 **DR. NETON:** Yeah, that's fine. We'll get it
24 out there.

25 **MS. MUNN:** Can we just amend that statement

1 a little bit to say could locate only
2 secondary documentation? It's not the primary
3 letter.

4 **MR. GRIFFON:** Yeah, secondary document, they
5 did identify secondary documentation
6 indicating that this was the case, okay.

7 Moving on down, if anybody ever, or
8 has any input, stop me along the way here, but
9 I'm down to item 1-b, number two. I had added
10 to this that NIOSH will provide the
11 methodology in how data will be used for dose
12 reconstructions. And this was for these
13 exotics for lack of a better term.

14 **DR. NETON:** And we still owe that as a
15 deliverable under the, I felt that we would
16 cover that in the example dose
17 reconstructions.

18 **MR. GRIFFON:** That's what I assumed.

19 **DR. NETON:** There was a number 11 and, I
20 believe, a number 12. One spoke to exotics,
21 and one spoke to, I think, thorium and
22 plutonium and other nuclides. And we need to
23 get those out.

24 **MR. GRIFFON:** And then 2-b, this question of
25 uranium enveloped, the Delta view uranium.

1 Did we see analysis on that? I thought, Jim,
2 that you were going to provide us with
3 something on that. I may be wrong on that.

4 **DR. NETON:** You know, Mark, my mind's a
5 little fuzzy on that. I know that we
6 discussed this at the last working group
7 meeting, and Bill Tankersley, I think, spoke
8 to an analysis, but I don't remember if we
9 handed it out or not.

10 Bill, can you help me out?

11 **MR. TANKERSLEY:** Sure, and we did send that,
12 you know, the highest number in the -- I've
13 forgotten now. There's a 700 or so such
14 uranium data in the Delta view image file and
15 the highest number I think is 330 or something
16 like that. And so the conclusion is that the
17 Y-12 electronic database, of course, bounds
18 the data, the uranium data that are in the
19 Delta view system.

20 **DR. NETON:** Well, this is a little more than
21 that, Bill. I thought that we were, and I
22 thought that we had done an analysis to
23 demonstrate that if the Delta view uranium
24 data were incorporated into the coworker
25 model, there would be no net effect on the

1 coworker model. And intuitively it kind of
2 made sense because there's only, what, 6,000
3 samples in Delta view versus literally
4 hundreds of thousands in the coworker, and I
5 thought that someone had done that analysis.
6 We talked about it at the last meeting.

7 **MR. GRIFFON:** Although the Delta view data
8 tended to be skewed toward those early years
9 when --

10 **DR. NETON:** I think that my recollection was
11 that the Delta view data were almost all
12 zeros. Remember, we had this discussion, and
13 --

14 **MR. GRIFFON:** Maybe this is just a small
15 follow up, but may be something. It seems, I
16 mean I don't disagree with what Bill just said
17 and what you said. Maybe just to close the
18 loop on that.

19 **DR. NETON:** I must have dreamt this, but I
20 thought we had an analysis that we discussed.
21 We'll follow up and make sure.

22 **MR. GRIFFON:** I don't recall. If it's out
23 there, then just let us know and we'll --

24 **DR. NETON:** I've been dreaming a lot lately.

25 **MR. TANKERSLEY:** Well, we could certainly do

1 that very easy, Jim, but nothing like that has
2 been done. If I understand you correctly,
3 you're saying to integrate those limited
4 number of Delta view data into the Y-12
5 dataset and see if it skews the percentiles or
6 whatever. That's easily done, but nothing
7 like that has been done.

8 **DR. NETON:** Yes, and I don't think, Bill, we
9 need to go as far as incorporating it into the
10 major database. I think if we just took some
11 summary statistics on the Delta view and
12 demonstrated that it was either consistent
13 with or provided lower values than the
14 coworkers data that were used then we'd be
15 okay. And my judgment, and maybe that's where
16 I dreamt this, that with all those zeros it
17 certainly wouldn't be skewing in a bias high
18 direction.

19 **MR. GRIFFON:** I agree, Jim, just for
20 purposes of closure.

21 **DR. NETON:** Absolutely, we'll make sure we
22 close that loop.

23 **MR. GRIFFON:** Number three I had that NISOH
24 will provide a (inaudible) to be used for dose
25 reconstruction for these radionuclides, and

1 maybe again this is in sample DRs?

2 **MS. MUNN:** That's my interpretation.

3 **MR. GRIFFON:** I think so. Is that correct,
4 Jim?

5 **MS. MUNN:** I thought that was what we asked
6 for. That we asked for them. Hello, Jim?

7 **DR. NETON:** Oh, I'm sorry I had it on mute.
8 Yes, I agree, but some of these probably won't
9 be covered though. For example, I discussed
10 neptunium early on and one could make a value
11 judgment whether we're on target with that or
12 not but --

13 **MR. GRIFFON:** It's something for obvious
14 reasons won't be covered, right?

15 **DR. NETON:** Right, but the key one in my
16 mind on this list is the plutonium exposures,
17 possibly the polonium. We did discuss the U-
18 233 alpha could be bracketed using the uranium
19 gross, the uranium measurements.

20 **DR. MAKHIJANI:** Jim, could I ask a question
21 about the U-233?

22 **DR. NETON:** Yes.

23 **DR. MAKHIJANI:** Would that mean that you'd
24 be assuming that things were U-233 instead of
25 U-234 the way you usually do?

1 **DR. NETON:** If it was activity, alpha
2 activity, we would just assume it was U-233.
3 Although I'm not sure about the daughters of
4 U-233. Let's see, that would indicate a
5 Thorium-229.

6 We were just having a sidebar
7 conversation. Liz Brackett is reminding me
8 that the dose conversion factors are almost
9 the same for U-234 and 233. Although does not
10 U-233 indicate a Thorium-229? I forgot. It
11 might. Thorium-229's got a lot of daughters,
12 but it might have a high enough half-life
13 where it wouldn't create much Thorium-229.

14 **MR. GRIFFON:** Either way you'll take the
15 conservative approach, right?

16 **DR. NETON:** Sure, if the dose conversion
17 factors were higher because of Thorium-229 in
18 gross which I'm not sure it does, we would
19 certainly make that adjustment. If they were
20 almost identical, then it wouldn't really even
21 matter for us in the dose reconstruction to
22 segregate out a U-233 exposure from a normal
23 uranium alpha exposure.

24 **MR. GRIFFON:** Any other comments on that?

25 **MS. MUNN:** We taking the position that the

1 examples then do cover that outstanding issue?

2 **MR. GRIFFON:** That's what I'm noting, Jim.
3 Is that accurate?

4 **DR. NETON:** That's, yes, I hope.

5 **MR. GRIFFON:** Now I'm down to number five,
6 and I just wanted to make sure I had this
7 correct, Jim. I put NIOSH indicated that the
8 final model to be used is in the latest site
9 profile document, for recycled uranium this
10 is.

11 **DR. NETON:** Right, our intent there was that
12 the write up that's in the last version of the
13 site profile is what we would use. And that
14 we could not identify a credible scenario that
15 would concentrate the individual radionuclides
16 above their arrival mixture. Outside of the
17 neptunium, it was intentionally pulled off our
18 ion exchange column.

19 So in other words it was not an
20 enrichment plant so there were no traps or
21 anything as such that might have been present
22 at places like Paducah or whatever. And so
23 we're applying those ratios. I think we added
24 one more piece to the evaluation report that
25 talks about the Paducah feed plant ash issue

1 that was raised by SC&A in, I think it was
2 example seven.

3 And you'll find in our example write
4 up there that rather than do a dose
5 reconstruction for number seven, we provided a
6 brief one-page write up as to why we felt that
7 there was no exposure scenario that we could
8 determine for the Paducah feed plant ash since
9 it wasn't processed at Y-12.

10 **DR. MAKHIJANI:** Jim, I took a brief look at
11 that at the break, and I presume that there is
12 some documentation saying that these plants
13 were never opened and so on.

14 **DR. NETON:** Well, I can't guarantee that's
15 true, Arjun. We need to look into that.
16 Bryce Rich is on the phone I believe.

17 **MR. RICH:** Yes, that's true. There are
18 some, a few references there. It's not
19 extensive but enough to convince that there
20 was no processing of the Paducah ash at Y-12.

21 **DR. MAKHIJANI:** Yeah, no, no, I understand
22 the no processing. I was just wondering
23 regarding the repackaging and so on.

24 **MR. RICH:** There was none of that there. It
25 delivered, I think as a reference indicates,

1 in metal containers. And as near as we can
2 determine by inventories, I believe I
3 understand nine metric tons could have been on
4 site.

5 Can I go back to the U-233 just for
6 clarification?

7 **DR. NETON:** Sure.

8 **MR. RICH:** The Uranium-233 process only
9 encompassed just a few months, consisted of
10 just a few kilograms, and was conducted in a
11 lockbox environment, and coupled with the dose
12 conversion would be essentially equivalent to
13 234 and appeared to be, addressed that.

14 **MR. GRIFFON:** All right, I think I'm down to
15 item 1-a in the external. And looking at item
16 three, I deleted the phrase more discussion is
17 needed on this topic. I think we've discussed
18 this already and SC&A is going to look at this
19 issue in the evaluation. It's fully
20 incorporated into the evaluation report as it
21 stands.

22 Is that correct, Jim?

23 **DR. NETON:** I agree with that.

24 **MR. GRIFFON:** And I think SC&A will capture
25 that in the review of the evaluation report.

1 Number four, this was, oh, this was, I
2 think you had finished up in Appendix 1 the
3 section where you showed 1953 data, Delta view
4 data.

5 **DR. NETON:** Right.

6 **MR. GRIFFON:** However, we did indicate that
7 in 1951 there was this question about a
8 discrepancy between the Delta view and CER
9 database, and I think you were going to follow
10 up on that and also other raw records. I
11 think you indicated in the last phone call
12 that you had found some cards related to
13 computer entries of some of external
14 exposures. And I don't know if you were going
15 to pursue that any further or what was done
16 with that.

17 **DR. NETON:** I'm pretty sure we haven't
18 pursued that any further at this point.
19 Again, time constraints came into play. I
20 don't, we don't -- Bill Tankersley or someone
21 at ORAU's side has an update on this. We have
22 not been able to put this issue, to advance
23 this issue any further.

24 **MR. TANKERSLEY:** Well, this is Bill
25 Tankersley. Very quickly and very briefly, we

1 had nothing to compare original data to in the
2 electronic database in 1950 and '51. There
3 are a number of records in there as Mark has
4 pointed out, but they're all zeros, and we
5 don't have an explanation for that. We feel
6 like the regression analysis model would be
7 applicable at times.

8 The third point there, none of us have
9 any -- and it must be a misunderstanding or a
10 missed communication -- none of us here have
11 any recollection of any punch cards for
12 external data. I don't remember any.

13 **MR. GRIFFON:** Okay, maybe I dreamt that one,
14 Jim, I don't know. I thought I heard, maybe I
15 was thinking about the urine punch cards, but
16 there was no, I will take your word on that.
17 I could have easily...

18 I guess the question on the 1951
19 records is, you know, in your evaluation
20 report you present the '53 and the fact that
21 it does compare very well. But in '51 it was
22 all zeros in the raw data or all zeros in the
23 database, and the Delta view data clearly had
24 a number of positive values. I mean not any
25 shocking values, but in the hundreds of

1 millirem.

2 **DR. NETON:** Were those pocket dosimeter
3 results?

4 **MR. GRIFFON:** No, no, no, there were pocket
5 dosimeter results, too, but there were film
6 badge measurements.

7 **DR. NETON:** I recall having this
8 conversation, and we just have not had time to
9 go and put that issue to bed.

10 **DR. MAKHIJANI:** I may be a little bit at
11 fault here. I have some Delta view database
12 image numbers that I think I said I would pass
13 on to you, and somehow at the end of the
14 meeting I did not. I will send you an e-mail
15 today.

16 **MR. TANKERSLEY:** Not necessary because we
17 have the Delta view data in a database here,
18 and Mark, you're absolutely right. There are
19 some film badge data in the Delta view system
20 for at least '51 I think. I'm not sure about
21 '50, but again, there's really, we don't know
22 of anything to do because the values that are
23 in this electronic database are all zeros
24 except for I think there's one positive value
25 in 1950.

1 As I remember, and we really have been
2 doing a lot of things, I think I checked the
3 number of people who were monitored, in other
4 words, who have IDs in those earlier years in
5 the electronic database against some numbers
6 that are said to be monitored in the HP
7 reports and they came out very close. We did
8 also do a very nice analysis, George and I, on
9 the records in 1959. They had a very nice
10 table where they had the number of people in
11 ranges zero to one, one to two, on up, I
12 think, up to 13 rem. And those numbers
13 compared to what's in the electronic database
14 were virtually perfect.

15 **MR. GRIFFON:** Right, right, I guess this
16 goes to just the fact that just because the
17 results are not the way, don't support your
18 case doesn't mean you don't include them in an
19 analysis of the reliability.

20 **MR. KERR:** Mark, the one thing you have to
21 be careful in that '51 data is a lot of the
22 people who are listed on those sheets are X-10
23 employees.

24 **MR. GRIFFON:** That might be one way to take

25 --

1 **MR. KERR:** There are a lot of them, and on
2 the first few sheets in the Delta view, the X-
3 10 people are not necessarily identified. As
4 you get over on some of the later sheets, they
5 start to identify the X-10 people. So what
6 you've got to sort of do is go back and
7 highlight the X-10 people on the earlier
8 sheets to really identify them. And once you
9 do that, you find out that I think the
10 preponderance of people on those sheets are X-
11 10.

12 **MR. GRIFFON:** Well, that may be, George, I
13 guess that's what I asked for. If that --

14 **MR. KERR:** That doesn't account for the
15 complete discrepancy, but that takes care of a
16 sizeable portion of it.

17 **MR. GRIFFON:** It may, yeah, and if it does,
18 that would be great if that was written up,
19 and that could very well explain the
20 difference or most of the differences anyway.

21 **MS. MUNN:** Is there anything in this
22 discussion that I have missed that would lead
23 us to anything other than a feeling of comfort
24 with respect to how the CER database is used?

25 **MR. GRIFFON:** Well, all I'm trying to do, I

1 guess what I'm trying to get at, Wanda, is
2 you've got very little raw data at all to
3 compare for the external. I think they've got
4 a fair amount that they've looked at for the
5 internal. And you've got, right now I see one
6 piece in 1953 from Delta view. And I think
7 that it's kind of sparse so to the extent we
8 can expand on that it would at least support
9 the case further.

10 **MS. MUNN:** So what you're asking for really
11 is just essentially what we've discussed here
12 right now, assurance that there is a reason
13 for the discrepancy?

14 **MR. GRIFFON:** Right, or just, yeah, if they
15 can cross-walk that and say these were all X-
16 10 people or all but one of them was X-10, and
17 therefore, some very minor discrepancy, then
18 that would take care of it.

19 **DR. NETON:** Let me make sure, Bill
20 Tankersley, you said you know where these
21 records are located? We don't necessarily
22 need Arjun's file?

23 **MR. TANKERSLEY:** Not necessary at all
24 because those data we have put in in a real
25 database. He's welcome to --

DR. NETON: No, no, that's fine, I just want to make sure that we were aware we're speaking of the same records, and I hear Mark pretty clearly here. We need to take a look at this to the extent we can, and then in the next few days, and try to address this issue.

MS. MUNN: And put the right words
somewhere.

DR. NETON: Right, I'm not sure where the words are going to go, but we will be prepared to at least comment on what we were able to do or not able to do, to accomplish.

MR. GRIFFON: And then number 4-a.

DR. MAKHIJANI: Mark, before you move on, there's sort of a point here that may be important as a question which is that in the evaluation report, and I think also maybe elsewhere -- I read too many documents I think -- the processes when you back extrapolate the '48 and '49, I think you say that the processes were the same as the early '50s. And I think in the TBD or TIB-0029 or some place you say that they were the same up to 1951.

So it seems to me that there were so

1 few people externally monitored in 1950 and
2 '51, 148 and 184, and since the processes seem
3 to have changed in '52, this question would
4 seem to be kind of rather in important in
5 terms of how you can handle the data since the
6 later data might not be applicable to the '50,
7 '51, '40 and '49 periods. At least that's how
8 I read your evaluation report. Maybe I didn't
9 read it right.

10 **DR. NETON:** I didn't catch all of what you
11 were saying, Arjun, but I think what we've
12 done is we've taken the 1951 data and went
13 back into '40, '49 and Liz Brackett is telling
14 me that she assumed that the (unintelligible)
15 occurred in '48. What that would imply is
16 that these were 1951 data for a 1948 and '49
17 intake which would really jack up those
18 intakes substantially.

19 **DR. MAKHIJANI:** No, no, I'm not questioning
20 the method in terms of internal dose at this
21 time. I just am trying to understand what's
22 happening in regard to the verification of the
23 external dose records here in that there
24 weren't many people who were monitored in '50
25 and '51, and even fewer in 1949. And so since

1 the processes changed in '52 that would also
2 presumably affect the external dose question.

3 And I notice that Dr. Kerr started his
4 external dose analysis only in 1951. It seems
5 like it's important as a technical issue in
6 terms of processes and job types to have this
7 1950, '51 external dose data with some
8 confidence as to what it was.

9 **DR. NETON:** I'm missing, I guess, the point
10 because we, George Kerr started in 1960 with
11 the external data and extrapolated backwards -
12 -

13 **DR. MAKHIJANI:** I'm not talking about the
14 147, I'm talking about the number of workers,
15 the charts in the Kerr paper handed out in
16 February then revised version in March that
17 showed the number of people monitored. Dr.
18 Kerr will know exactly figures one and two
19 that I'm referring to that showed the
20 cumulative personnel doses as well as the
21 individual doses and the persons monitored.
22 That analysis started in 1951, right?

23 **MR. KERR:** Yeah, I'm here. I just tried to
24 get together some stuff. We found out when we
25 did it, histograms and quartile plots that we

1 had trouble fitting anything to the external
2 data. We're talking about distributions of
3 any sort. Quarterly data before the third
4 quarter 1956 did not fit a lognormal or any
5 other commonly used statistical distribution.

6 And there were several reasons for the
7 lack of fit. Prior to the third quarter of
8 '56 where one the small size of the monitored
9 populations, the frequent exchange of the film
10 badge dosimeters, and the methods of assigning
11 dose if the measured dose was less than the
12 limit of detection. So that's why we did,
13 selected out that group to do our regression
14 analysis. So anything back past '56 is based
15 on a regression analysis not based on the
16 actual doses to the population of monitored
17 workers.

18 And that's because of the problems we
19 had with that early data because sometimes
20 they used zeros instead of the LOD, sometimes
21 they assigned as much dose as 50 to someone
22 whose measurement was between the LODC. You
23 get these strange distributions that are hard
24 to deal with. So we went ahead and did the
25 regression analysis to get us back to the

1 earlier days which is based on these
2 populations that are well defined, we know who
3 the workers were that were in them.

4 Now the thing we did do is Bill and I
5 and Janice Watkins went back and looked at
6 external radiation monitoring at the Y-12
7 facility during the '48, '49 period. That
8 data is not part of the CER database. It's
9 not electronically available.

10 **MR. TANKERSLEY:** Yes, it is.

11 **MR. KERR:** Okay, it's electronically
12 available.

13 **MR. TANKERSLEY:** It's not included in.

14 **MR. KERR:** What's the problem with that,
15 Bill? It's in a different format.

16 **MR. TANKERSLEY:** This is that 11,000 record,
17 approximately 11,000 record set of data that
18 I've mentioned several times before. They
19 were on the cards, the original cards. As a
20 matter of fact I just looked at those again
21 earlier this week.

22 **MR. GRIFFON:** That's what I was talking
23 about, cards.

24 **MR. TANKERSLEY:** Yeah, I thought about that,
25 Mark. That's what you were talking about,

1 yes. And they have film badge results, open
2 window shielded and also a chamber data. And
3 those data are in the electronic database
4 since the format, you know, there were two
5 different chunks of data and the formats are
6 different. They're not attached to the main
7 Y-12 database, but they are available. I know
8 that they're available on the O drive. They
9 were set up there, like I say, a year or so
10 ago. But they do, they are perfectly matched
11 because we input them.

12 **MR. KERR:** The thing is we went back and
13 looked at these separately, and all backward
14 extrapolations show that our estimates for
15 '48, '49 are extremely claimant favorable
16 compared to the actual doses measured in '48
17 and '49.

18 **MR. TANKERSLEY:** The data's available in TIB
19 -- let's see what it's number -- 0047.

20 **DR. MAKHIJANI:** I guess I have not seen any
21 of the actual data for '48 and '49. There is
22 the '50, '51 data in the CER database, but --

23 **MR. TANKERSLEY:** We put that on the O drive
24 so anyone who was interested could look at it.

25 **MR. KERR:** Wallace made that available, like

1 I say, months and months ago. And Arjun, the
2 reason why you probably haven't seen it is, as
3 I said, it is not in the same file as the '50
4 to '88 set. And then of course we do have
5 data after that. But generally speaking what
6 we work with is that large 600,000 record file
7 that goes from 1950 to 1988. That set of data
8 I assure you is available on the O drive.

9 **DR. MAKHIJANI:** Oh, no, I'm not disbelieving
10 you, I just, I haven't seen it and the
11 oversight is surely mine.

12 **MR. GRIFFON:** Jim, can you try to get that
13 onto the AB review? You know, that section
14 that we have dedicated?

15 **DR. NETON:** Sure.

16 **MR. GRIFFON:** Just so we don't stumble
17 around looking for it or whatever.

18 **MR. KERR:** Yeah, that's the part that would
19 be useful.

20 **DR. NETON:** Are you talking about the '48,
21 '49 external data?

22 Bill, you know what file they're
23 talking about, right?

24 **MR. TANKERSLEY:** I know perfectly, and by
25 the way now go ahead and answer the question.

1 Are some of the folks wanting to see copies of
2 the original data?

3 **MR. GRIFFON:** Is that the database that
4 file, Bill, or is that data? What is that
5 file you're talking about?

6 **MR. TANKERSLEY:** Those are cards, Mark.
7 They're not the IBM cards. I don't think they
8 were using them in the late '40s. This is
9 the, everybody can speak for themselves here,
10 but this is the more or less square card that
11 has the punches all the way around it where
12 the metal rod can pull out certain cards. And
13 they have the names and the data. As I said,
14 we used to own the original cards, but years
15 and years ago they were returned to the Record
16 Center, I believe, and then they subsequently
17 ended up over at the Y-12 record center. As I
18 said, I literally looked at them on back
19 Monday of this week, I think. We may have
20 copies of them, and I know I can get copies of
21 them, at least some of them.

22 **MR. GRIFFON:** I think probably whatever you
23 have posted now on the O drive is what we
24 need.

25 **DR. NETON:** Bill, if you send me the

1 location where they are on the site research
2 database, I will make sure I put them in the
3 AB Document Review folder.

4 **MR. TANKERSLEY:** Ten-four.

5 **MR. GRIFFON:** Okay, and are we on to item
6 number 4-a then. I think that is just what
7 Bill's talking about there. And I'm not sure
8 that those cards that I was speaking of
9 before, because he says they're from the
10 earlier time period, I don't think they would
11 be useful in looking at the CER external
12 database reliability for purposes of '50 to
13 '88 or whatever, obviously. So that point, I
14 sort of missed the time period on those cards.
15 So I think that action item will go away,
16 number 4-a. Am I right about that, everybody?

17 **MS. MUNN:** Yes.

18 **MR. GRIFFON:** I'm not hearing anything. All
19 right, and then I'm down to 2-a-1. Just
20 points of closure again, Jim, item 2, I don't
21 know. You spoke of this several times but the
22 criticality, I think you said you had a write
23 up on that. Did you? I don't recall whether
24 that was ever --

25 **DR. NETON:** I thought I provided it, but I

1 will, I will make sure that if it's not on the
2 O drive of the AB Document Review folder, it's
3 there. It's a draft document that Bill --

4 **MR. GRIFFON:** SC&A, do you recall if you've
5 seen this or I may have missed this.

6 **MR. FITZGERALD:** I think it was a handout at
7 the last meeting.

8 **DR. NETON:** Well, I'm not sure. It would
9 have been a fairly thick document, but there
10 is really only one section is relevant that
11 speaks to what the exposure conditions were
12 prior to the criticality accident. That is,
13 that the tanks had been all, they thought they
14 were clean and the linings were empty and that
15 sort of thing, and of course, they were wrong.

16 And that addresses the issue as to why
17 a number of those workers were not monitored
18 when one would think if there was a
19 criticality, you would have uranium there, you
20 should have been monitored. And there's about
21 two or three pages, if I recall, that are
22 relevant, and I may just put those pages out
23 there. The rest of it is really sort of
24 criticality response and evaluation of the
25 doses, et cetera. I'll do that.

1 **MS. MUNN:** We did see something at the last
2 meeting on that. I can't remember.

3 **MR. FITZGERALD:** Yeah, I think it was a few
4 pages. It may have just been an excerpt of
5 the one you're talking about.

6 **DR. NETON:** That sounds like the document,
7 but I'll make sure it's available on the O
8 drive and people can look at it.

9 **MR. GRIFFON:** Now I'm down to item, well,
10 three and four kind of go together. I left
11 them this way because it was, in the last
12 matrix it was this way. But three was NIOSH
13 will provide this addendum, and they did. And
14 four was SC&A will review it. And I just
15 edited it, number four, to say that SC&A will
16 review and provide comments on these reports
17 in the context of the SEC petition review.
18 Because I think these reports are included,
19 and so I don't expect a separate deliverable
20 on this. John, if you're, I think this would
21 all be part of your --

22 **DR. MAURO:** Yeah, that'll make it a little
23 easier for us. We can take care of it when we
24 deliver our report.

25 **MR. GRIFFON:** And number five was addressed

1 as far as the assembly worker question went?

2 **DR. NETON:** Yes.

3 **MR. GRIFFON:** Then 2-b-1, I'm not sure, was
4 item 1 completed?

5 **DR. NETON:** I thought it was because we did
6 see comments from SC&A, but there were really,
7 but the main issue that we discussed was the
8 evidence or existence of very low-energy
9 neutrons. At the working group meeting we
10 asserted that we could not find any mechanism
11 or moderator in the process areas where
12 there's very small diameter piping and very
13 small quantities of uranium going through it
14 to moderate the neutrons down to such a low
15 energy. And I thought that SC&A had agreed
16 that that was acceptable.

17 **MR. FITZGERALD:** Well, I think the way it
18 was left, this is Joe Fitzgerald. I think I
19 agree with you, Jim. I think the way it was
20 left was that was the, certainly, the
21 assertion that certainly there was no evidence
22 or examples of sources of moderation in the
23 plant. And I think it was sort of inferred
24 that unless we could identify such sources of
25 moderation, then that's pretty much where

1 things would stand.

2 **DR. MAKHIJANI:** This is Arjun, Jim. I agree
3 that we left it there, but then you puzzled me
4 again because in your dose reconstructions,
5 either number one or number three, you say the
6 worker, John Doe, was exposed to low, medium
7 and high energy neutrons. I got very confused
8 by that.

9 **DR. NETON:** Let's strike out low. I think
10 that was a carryover from the request from
11 SC&A that we do that, and yes, strike that
12 out.

13 **MR. GRIFFON:** That sounds familiar because
14 it was requested, and you commented on that
15 before.

16 **DR. NETON:** We commented, and then we just
17 accidentally left in low.

18 **DR. MAKHIJANI:** Okay, fine, so it was just
19 kind of an oversight.

20 **DR. NETON:** Yes.

21 **MR. GRIFFON:** So one is completed and if
22 it's going to be considered at all, it'll be
23 considered in the petition review or in the
24 sample DRs, I assume.

25 NIOSH will -- number two -- NIOSH will

1 provide a newly developed model for beta
2 exposure.

3 **DR. NETON:** Yeah, the model, the write up is
4 in the evaluation report for the beta
5 distributions. They're there, and in fact,
6 George Kerr distributed at the last working
7 group meeting a write up on betas. And we do
8 have one example dose reconstruction that we
9 still owe you, which would reconstruct the
10 dose for beta, an unmonitored worker exposed
11 to beta activity. I think even further beta
12 activity that is extremity exposure.

13 So you can certainly review what's in
14 the evaluation report in Appendix 1, and then
15 we will have a sort of proof of principle
16 example which I have on my computer. I just
17 got it a little too late to make it available
18 to the working group and will put that out
19 there shortly.

20 **MR. GRIFFON:** All right, and I think that's
21 it. That brings us to the sample DRs. Unless
22 there's any other questions on the matrix, I
23 guess I'll turn it over to Jim and let you
24 step us through some of the examples.

25 **MS. MUNN:** That leaves us with essentially

1 four relatively minor items on the matrix to
2 be documented somewhere, right?

3 **MR. GRIFFON:** Right, I didn't count, Wanda,
4 but a lot of things were deferred to sort of
5 the review of the full evaluation report,
6 right?

7 **MS. MUNN:** Right.

8 **MR. GRIFFON:** Yeah, and a couple small items
9 just to wrap up. We have nothing hanging out
10 there, no. That's for sure.

11 **MS. MUNN:** The big reports are.

12 **SAMPLE DOSE RECONSTRUCTIONS**

13 **MR. GRIFFON:** All right, Jim.

14 **DR. NETON:** What we have in these example
15 dose reconstructions are sort of a modified
16 version of what was requested. And if you
17 remember SC&A put out sort of a straw man
18 document that said here's eleven potential
19 dose reconstructions you might be interested
20 in seeing. But they also allowed for the fact
21 that some of these might be combined and some
22 we might want to review and look at and
23 determine the relevancy, that sort of thing.

24 Where we ended up at the end of the
25 day, we think that we have not eleven, but --

1 let's see, how many do we have here? About
2 nine dose reconstructions that document what
3 we believe to be at least proof of principle
4 for being able to bound exposures and yet have
5 those exposures be in a plausible range.
6 They're not coming up with doses that just
7 wouldn't make sense. And so these are
8 somewhat modified from the original SC&A
9 request, and I'll try to point out why where
10 it might be relevant.

11 The first one had to do with trying to
12 assign a neutron dose assessment to a
13 hypothetical machinist operator. And I should
14 point out none of these are real cases with
15 the exception, I think, of number three, and
16 that's been pretty, there's no Privacy Act
17 information to my knowledge in there. This
18 hypothetical machinist operator who was
19 exposed to -- and scratch low to a medium
20 neutrons. And the idea was that he may have
21 worked in the cyclotron areas and maybe
22 industrial X-ray units.

23 So what was reconstructed here was the
24 dose to the prostate for this individual who
25 had an employment history starting in 1948 and

1 ending in 1957. We ended all of our
2 evaluations at the end of the SEC class period
3 just for convenience purposes because we were
4 trying to focus in on the issues relevant to
5 the report.

6 And what you'll see here is that the
7 person was assumed to have no dosimetry data
8 between 1948 and '56, that is, no monitoring
9 data whatsoever. But he was monitored in 1957
10 with summary data only. That is, all we know
11 is he had 100 millirem deep, 150 millirem
12 shallow, and a neutron result of zero.

13 Now we're in a little bit of a dilemma
14 with these type of examples because as I
15 indicated at the beginning when I was
16 summarizing the evaluation report, it is our
17 opinion that in the cyclotron area workers
18 were monitored. I mean, we have pretty good
19 documentation that they were required to be
20 monitored so it would be almost impossible for
21 a person working in the cyclotron area to not
22 have any monitoring data at all.

23 That being the case though using our
24 efficiency approaches, we went ahead and made
25 some broad stroke assumptions. That is, we

1 assumed he was actually unmonitored and
2 assigned him coworker dose based on the
3 models, scaling models, that we've talked
4 about for photons. That is, the backward
5 extrapolation into the 1948 to '56 timeframe
6 and assign the person photon dose using that
7 technique.

8 And then his monitored dose in '57 --
9 and by the way, whoever was doing these dose
10 reconstructions correctly because I'm
11 interpreting these, but I think I've got it.
12 We used the monitoring data in '57, but we
13 assigned, I believe, missed dose assuming all
14 that material, all that exposure was delivered
15 in one badge exchange. So that increased the
16 person's exposure in a claimant favorable
17 fashion.

18 And then the neutron dose gets a
19 little bit more difficult. Again, we find it
20 almost no credible scenario where a person
21 could have been working in certain areas and
22 not have neutron values. I mentioned that
23 after about 1950 the NTA film was in the
24 workers' badges. They made a determination to
25 read them or not depending on their potential

1 for exposure.

2 The most credible scenario we could
3 envision that this person could have been
4 exposed to was working in the storage area
5 with enriched uranium that had a one-to-one
6 neutron-to-photon ratio. But based on the
7 imputed dose using the photon dose based on
8 the back extrapolation technique, one assumes,
9 one arrives at a neutron dose that could have
10 been there.

11 Given all that and adding it up, and I
12 won't get into some of the summaries of
13 radiation types, et cetera. You can read that
14 on your own. The first ended up with a total
15 reconstructed photon dose of 6.9 rem and a
16 neutron dose of 10.2 rem. And even under
17 these assumptions which are fairly claimant
18 favorable, the PC is under 22 percent.

19 So that's the first one. Are there
20 any questions or ...

21 (no response)

22 **DR. NETON:** Okay, let's move on then?

23 **MR. GRIFFON:** Sure, yeah.

24 **DR. NETON:** Case number two was something
25 that we didn't do because I think that it

1 passed for us to reconstruct exposures to low-
2 energy neutrons, and we just again, you know,
3 are of the opinion that we couldn't come up
4 with a plausible exposure scenario for that
5 type of situation.

6 Case number three tried to elucidate
7 how we would do neutron dose assignments when
8 the doses were zero, actually zero in the
9 record. And if you remember, if a person was
10 monitored, they were all monitored for
11 neutrons, but it's possible that zeros were
12 entered in there even if the badge had not
13 been read.

14 Again, we have a similar situation
15 where a person was unmonitored, the cancer
16 reconstructed here would be the prostate,
17 assumed employment start date '50, ended in
18 '57. Again, this was a cyclotron worker, no
19 monitoring between 1950 and '54, monitored for
20 neutrons and photons from '55 to '57 with
21 summary data only.

22 Now, this says use worker number 51.
23 That's case 51, and that's not a claimant
24 number or anything, that's just a sequentially
25 assigned number. In Appendix A-2 they used

1 his exposure scenario to do this dose
2 reconstruction. In a very analogous manner
3 this early dose was reconstructed in '50 to
4 '54 using the coworker approach. Again, we
5 believe that a person working in the cyclotron
6 would have had his badges read, but
7 nonetheless we went ahead and assigned these
8 zeros as real. And I'm looking here as to how
9 we -- we assumed -- I have to go back here and
10 look at this narrative for a second.

11 We used the coworker, this dose was
12 reconstructed from '50-'54 because the photon
13 -- I'm drawing a blank. Can someone help me
14 out here from the ORAU side as to what we did
15 for the neutron exposures on this person?

16 (no response)

17 **MR. GRIFFON:** You're on your own.

18 **DR. NETON:** I'm on my own.

19 **MR. KERR:** Are you looking for the neutron
20 exposures?

21 **DR. NETON:** Yeah, what did we do for the
22 neutron exposure in the 1950 to '54 period?

23 **MR. REED:** This is Steve Reed. I just
24 jumped in here, and I'm trying to figure it
25 out myself. I did the dose reconstruction,

1 but I did many of these, and I haven't looked
2 at this one for quite some time.

3 **DR. NETON:** I'm trying to see what ...
4 Missed dose was not assigned separately
5 because the period ...

6 **MR. KERR:** Yeah, I don't think I assigned
7 any missed dose for '50 to '54 because there
8 were no --

9 **DR. NETON:** What neutron dose was assigned
10 in '50 to '54? That's what I'm trying to
11 figure out here.

12 **MR. KERR:** Well, from '50 to '54 the neutron
13 dose was based on the model photon doses
14 because that's, we used coworker data for
15 those years.

16 **DR. NETON:** Correct, but what ratio did we
17 use here for neutron to photon? I don't see
18 that.

19 **MR. KERR:** A one-to-one ratio which isn't
20 evident in this dose reconstruction.

21 **DR. NETON:** Right, that's why I was drawing
22 a blank. I didn't see that in here.

23 **MR. KERR:** We used the 9212 Building
24 assumption which is the one-to-one.

25 **DR. NETON:** Okay, that's the same assumption

1 that what was used in the previous dose
2 reconstruction. The photon dose was
3 reconstructed, and then the neutron dose was
4 used based on the enriched uranium storage
5 area ratios and assigned for '50 to '54. And
6 then when one gets to the period where he was
7 monitored for neutrons and photons from '55 to
8 '57, it was essentially a missed dose
9 calculation assuming, I think, that all of the
10 results, all of the dose was received in one
11 badge exchange. And knowing the badge
12 exchange frequency in that period, that this
13 dose was added for each of the missing,
14 potential missing reads. And that ended up
15 assigning a 20.5 rem total dose.

16 By the way, I don't take credit for
17 the fact that we can read these figures, but
18 in dose reconstructions we get down to the
19 millirem because oftentimes claimants like to
20 see it down to the millirem level. But the
21 missed photon dose was three-and-a-half. The
22 photon dose as reconstructed was 5.8, neutron
23 dose was 7.5, and missed neutron dose was 3.7.
24 Given the total deep dose was 20.5 rem, the PC
25 for this case ended up being about 18.2

1 percent.

2 **DR. MAURO:** Excuse me, Jim. This is John.
3 Given that we're going to be in an expedited
4 process to be using this material to sort of
5 track closure on the issues, would it be
6 acceptable to the working group for us to be
7 able to interact directly with the authors of
8 these example dose reconstructions?

9 **MS. MUNN:** I think it's desirable.

10 **MR. GRIFFON:** Yeah, I don't have a problem
11 with that. I think that's appropriate, yeah.

12 **DR. MAURO:** That would be great. That being
13 the case if the names of each of the authors
14 or the principle authors could be provided, we
15 could get this going aggressively.

16 **DR. NETON:** I might want to be a little
17 careful there, John. The authors of dose
18 reconstructions are fine. I think we could
19 interact, but it would be good if we all could
20 have, I don't know how to put this, but
21 support people working with them because to be
22 fair to the dose reconstructors. You know,
23 they're doing these based on emerging issues
24 that occur at these working group meetings.
25 And to the extent they can, they're using very

1 standard principles and procedures. But in
2 some cases, and I'll point to the extremity
3 dose issue, we've had to work very closely
4 with them.

5 **MR. GRIFFON:** I guess from the worker group
6 standpoint I think it's appropriate for you to
7 directly work through Jim on this. How you
8 get the author on the line, that's up to, you
9 know, you guys can work that out, but it can
10 be an informal interaction I guess is what,
11 John, what mainly what you're looking for,
12 right?

13 **DR. MAURO:** Exactly, the reason is that it's
14 been our experience very often a large portion
15 of our time when we look at cases is just
16 trying to figure out, get the path that was
17 followed, the assumptions, because sometimes
18 all of the assumptions are not there and it
19 takes a little digging. If we could just go
20 directly to the source that could expedite
21 things.

22 **DR. NETON:** I think we could certainly set
23 that up, but I guess if you'd work that
24 through me that would be helpful. I guess I'd
25 just like to be in the loop and in the know as

1 to what's transpiring.

2 **DR. MAKHIJANI:** John, this is Arjun. You
3 know the way Jim and I, I think if I might
4 speak for us, Jim, worked pretty efficiently
5 before on some of this where we had e-mail
6 interchanges on these kind of detailed
7 technical questions and we just published the
8 e-mail so everybody was in the know about what
9 happened. And still I did not feel
10 constrained in any way in our communication.

11 Did you, Jim?

12 **DR. NETON:** No, I think that worked fine.

13 **DR. MAKHIJANI:** I think it went very easily
14 and was also very transparent so maybe we
15 could just in this case we could have the
16 names then Jim and that principle author would
17 be part of the e-mail exchange which is
18 documented and get the questions answered.

19 **MR. GRIFFON:** That's fine, Arjun, but I
20 don't want to constrain you in any way. If
21 you need to pick up the phone and say I'm
22 looking at this right now. I've got this page
23 open and, you know.

24 **DR. MAKHIJANI:** Yeah, I agree, but time is
25 very, very short so I think John is right. We

1 have, even though it seemed like a crunch
2 then, I think we have much more time.

3 **DR. NETON:** Yeah, I think, Arjun, I like
4 your proposal, and what might work best if you
5 just sent it on to me, and I'll make sure that
6 the right people are touched on the ORAU side.
7 Because then you certainly would have the dose
8 reconstructor involved, but like I said, there
9 are other folks who are working closely with
10 the dose reconstructors to make sure we're
11 representing the current state of our
12 evolution of this process. And that's totally
13 acceptable to us that we work that way. And
14 if it gets to the point where an e-mail
15 exchange gets fairly cumbersome and we're
16 writing pages, then we could facilitate some
17 kind of a phone call with minutes as we've
18 done in the past.

19 **MR. GRIFFON:** Yeah, that was my point.

20 **MS. MUNN:** The crunches do seem to get
21 crunchier as time goes on, don't they?

22 **DR. NETON:** Yes, they do.

23 Okay, any more comments or should I
24 move on?

25 (no response)

1 **DR. NETON:** The case number four we have in
2 the works, and I need to provide that to you,
3 that is the extremity dose assignment for
4 betas that applies to that coworker model that
5 George Kerr developed. And we'll get you that
6 as soon as possible.

7 Case number five puts us in the realm
8 of uranium dose assessments, and this would be
9 a hypothetical machinist. I think these were
10 hypothetical. But the example machinist
11 operator exposed to enriched uranium, if this
12 person worked around enriched uranium in say
13 Building 9212, 9988, again, we're not
14 accounting for any thorium here at all because
15 we feel we're only reconstructing doses that
16 we feel that we can. This dose was
17 reconstructed to the --

18 **MR. GRIFFON:** Just one more thing on the
19 thorium. I know we've beat this around
20 awhile, but the only thing that I guess I get
21 concerned about because I, you know, in
22 reading this in preparation for the phone call
23 that's the one obvious thing that stuck out is
24 how are you going to narrow that population.
25 And I'm concerned now that by defining it the

1 way we are, I'm worried, and I guess we have
2 to wait for DOL's response to this, but I'm
3 worried that we're defining a class that can't
4 be administered. That DOL will not have
5 enough information to make a determination of
6 who was or was not thorium workers, and we're
7 sort of setting up a failed process here.

8 That's, this is a little aside here,
9 but I guess again we best, Lew's going to
10 follow up with DOL and it may be more of a
11 policy-type question. But I mean, just to get
12 that into the record. I mean I think we --

13 **DR. NETON:** I don't disagree with you. I
14 mean we need to hear Labor's input on this.

15 **DR. WADE:** I think Mike made the point very
16 clear before, and it's on the record, and
17 we'll try and work through it.

18 **MR. GRIFFON:** Okay.

19 **MS. MUNN:** One's first thought reading this
20 evaluation is it's going to turn out to be an
21 awful lot of people, a high percentage, I
22 think.

23 **MR. GRIFFON:** Yeah, and I hate to put an
24 unresolvable problem in the hands of DOL.
25 That's the other question.

1 **DR. NETON:** Right, this is going to be sort
2 of a consistent issue I think though because
3 we, just to claim that we're going to add a
4 class or a bunch of workers, we're going to
5 have to almost acknowledge up front we know
6 almost nothing about them other than there was
7 a large amount, enough material there to
8 expose them and there were. It seems like if
9 we knew a lot more we would probably be able
10 to do something.

11 **MR. GRIFFON:** And on the flip side, if we
12 get into this situation where DOL requires
13 proof from the individual that they worked in
14 that building and worked with thorium, I don't
15 know how an individual provides that either.
16 I guess I get worried. I guess Mike stated it
17 very well. We're going to follow up --

18 **MR. GIBSON:** This is Mike. I'm sorry, I
19 didn't mean to cut you off, Mark.

20 The lack of records it seems, I know
21 SEC kind of turns around the burden of proof
22 back on the government, but the lack of
23 records also, you know, to the claimant is
24 their defense.

25 **MR. GRIFFON:** Right, then to prove that you

1 were quote/unquote a thorium worker, I mean,
2 it's one thing to prove that you worked at
3 Paducah for 250 days, but it's another thing
4 to prove that you were a thorium worker in
5 9212, especially if you're, it's a survivor
6 claim and they would have no knowledge of
7 exactly what they were doing in those
8 buildings. So it might --

9 **DR. WADE:** We understand. I mean just for
10 the record, if Larry's on the phone, prior to
11 releasing the evaluation report we took the
12 proposed class definition to DOL. So we had
13 discussion with the belief that they felt they
14 could administer this, but we need to bring
15 them to you to talk about it.

16 **MR. ELLIOTT:** Yeah, that is correct, Lew, as
17 part of the process of making sure that we can
18 administer with DOL developing cases that fit
19 into the class, they understand the definition
20 that we're proposing and recommending. And
21 just for clarity's sake and for the record
22 there, in our discussions with DOL there was
23 no indication that there was a requirement
24 that a worker or burden be placed on a worker
25 to indicate or prove that they were working

1 with thorium. The definition of the class
2 specifies that thorium exposure existed in
3 those buildings; and therefore, as I
4 understand DOL's policy and procedures, they
5 would just need to put people in those
6 buildings.

7 **MR. GRIFFON:** How we generally do this. I
8 mean, maybe not even specifically for this
9 petition, but at least tell us what they can
10 about their policies and procedures with
11 regard to placing the -- I guess I don't want
12 to be in a position of recommending something
13 that can't be administered.

14 **DR. WADE:** It could well be the Board, based
15 upon what it hears from DOL, might temper its
16 judgment on the evaluation report. And that's
17 quite reasonable.

18 **MR. GRIFFON:** I'm sorry to sidetrack on that
19 issue again. I just --

20 **DR. WADE:** Now, well as I said in this
21 program, and I'm relatively new to it, I mean,
22 there's always some new vexing issue. But if
23 we get the right people in front of the Board,
24 and the Board hears what they have to say, and
25 then I trust the Board to make the appropriate

1 judgment.

2 **MS. MUNN:** It is a vexing issue. It's
3 unfortunate that we have absolutely no thorium
4 data, but then given the period that we're
5 looking at and the reality of life at that
6 time, it's not really astonishing. It's just
7 unfortunate.

8 **MR. GRIFFON:** Okay, but as far as reviewing
9 this sample DR, I think what we're asking SC&A
10 to do is consider this as a uranium case and
11 not look at the potential thorium exposures at
12 all.

13 **MS. MUNN:** That's what I heard.

14 **MR. GRIFFON:** Okay, Jim, I'm sorry to cut in
15 there.

16 **DR. NETON:** Okay, so this is a machinist
17 operator working in an enriched uranium area
18 who developed colon cancer hypothetically and
19 his employment period was from '48 to 1950.
20 This, I think, was SC&A's attempt to say well,
21 what are you doing in that era when you have
22 no bioassay data. I think the original one
23 talked about only fluorometric data. In fact,
24 we don't even acknowledge we have (inaudible).
25 It might have been a couple samples, but we're

1 really not using those at all in the early
2 time period.

3 So this is a case where he was
4 monitored for, he didn't have any urinalysis
5 data except he had one result apparently we
6 decided in 1950 in this case. So what we did
7 was we assumed, we used a coworker model that
8 went back into the early period, 1948 through
9 1950 to estimate this person's dose. And it
10 turned out that using that model, one comes up
11 with a fairly substantial intake of like
12 three-and-a-half microcuries, somewhere
13 thereabout. It's just a large intake
14 projected for that time period.

15 Type-S was used again as our normal
16 policy was to go through and take the
17 solubility class that is the most claimant
18 favorable if we don't know what the exposure
19 was to. And we used Type-S, 100 percent
20 Uranium-234 was used as normal in these cases
21 because that tends to maximize the dose
22 because it's got the highest alpha energy.

23 And doing that and modeling one
24 positive sample in there as well, sort of
25 superimposing one acute intake on top of this

1 chronic exposure scenario, we ended up with a
2 PC of 5.6 percent for the colon which is I
3 think you're going to see is fairly typical
4 for non-metabolic organs that are exposed to
5 uranium.

6 I mean, if the organs are non-
7 metabolic, I mean, the organ does not
8 concentrate the uranium to any appreciable
9 extent. It's certainly in the bloodstream and
10 it passes through those organs, but if there's
11 no concentration mechanism, it takes fairly
12 substantial intakes to get PCs that are
13 anywhere above single digits.

14 **DR. MAURO:** Jim, this is John. For the one
15 measured data point, was that expressed in dpm
16 or micrograms or milligrams per liter?

17 **DR. NETON:** That was a dpm value which is
18 interesting. I'm not sure why we would have a
19 dpm per day in June 1st, 1950, although. Yeah,
20 that's an interesting -- well, it was a made
21 up case so, you know, the example stands as
22 it's written even if we, we took out the made
23 up 230 dpm value, one would get the same idea.
24 I'm not sure exactly why we threw in this
25 acute intake, this value, in 1950. We might

1 want to re-think that and pull that out and
2 make it more realistic. I think the intent
3 here is to show that we would use real data if
4 we had it, and so it was thrown into this as
5 an example, but the reality is that we don't
6 have any data to hang our hat on in that time
7 period.

8 **MR. GRIFFON:** Is that why, I highlighted
9 here with the exception of one, and therefore,
10 so you have one value above the detection
11 limit?

12 **DR. NETON:** Right.

13 **MR. GRIFFON:** And that's why you, I wondered
14 why --

15 **DR. NETON:** I think it was just to show that
16 we --

17 **MR. GRIFFON:** To show that you might have
18 one or two data points.

19 **DR. NETON:** Right, and this would apply to
20 later years where we would have one or two
21 data points. I think I've got an example
22 coming up that does that where we would
23 certainly use all valid, what we consider to
24 be valid bioassay results above the detection
25 limits. But we would always have that

1 superimposed on top of samples are at the mda
2 or below, we would assume that the person was
3 at half of the mda in their exposure scenario.

4 **DR. MAURO:** Jim, if you were to hypothesize
5 that the one reading that you had was a
6 milligram for 24 hours per liter, I remember
7 coming across recently as part of Task Three,
8 that you do now have a procedure to convert
9 milligrams to dpm as a function of enrichment
10 level. Would I be correct in assuming if, in
11 fact, you hypothesized that you actually had a
12 milligram number for that 1950 value, you
13 would use that protocol?

14 **DR. NETON:** We could certainly calculate how
15 many, how much activity, if we knew the
16 enrichment, we could calculate how much
17 activity that map of uranium was, corresponded
18 to.

19 **DR. MAURO:** Is it reasonable to assume you
20 would know that enrichment?

21 **MR. GRIFFON:** That's a different question
22 there.

23 **DR. NETON:** It's a different question. I
24 think we would know a bracketing enrichment.

25 **DR. MAURO:** You see where I'm going.

1 **DR. NETON:** Yeah, but I think that the
2 database itself, the CER database, all the
3 data we have are in dpm. Is that not right?

4 **DR. MAURO:** Yes.

5 **MR. GRIFFON:** That is, yeah, that's right.

6 **DR. NETON:** I'm sure that the coworker model
7 is all in dpm so they were, if they were not
8 in activities they were converted somehow.
9 They must have been converted using that
10 equation. I mean --

11 **MR. GRIFFON:** Don't say somehow, Jim.

12 **DR. NETON:** Well, I'm sorry. Right, so the
13 coworker data as Liz is reminding me were
14 already in dpm.

15 **MR. GRIFFON:** That's why you have dpm
16 values.

17 **DR. NETON:** Right. So we have all dpm so
18 that takes the conversion out of the picture.

19 **DR. MAURO:** Okay.

20 **DR. NETON:** Now we would not have a
21 microgram value to use if there was coworker
22 data. Now if we had a mass data that was
23 reported in a claimant's file, it's possible
24 we could have microgram values in a claimant's
25 record.

1 **MS. BRACKETT:** Doesn't their data come from
2 the same place as the CER?

3 **DR. NETON:** Yes.

4 **MS. BRACKETT:** There's nothing else besides
5 that I thought.

6 **MR. GRIFFON:** Well, there's Delta view data,
7 but I don't --

8 **DR. NETON:** Delta view --

9 **MS. BRACKETT:** Yes, in peoples' files.

10 **DR. NETON:** The Delta view, yes. And the
11 way it's portrayed in our documents, and we
12 believe this to be the case, is that if a mass
13 measurement was made, it was only made for
14 people who were working with unenriched
15 uranium. If an alpha measurement was made, it
16 was for people who were working with
17 potentially enriched material. That's a
18 distinction that's been made pretty much
19 throughout the history of this program as far
20 as I can tell.

21 **MR. GRIFFON:** Even see it in the early
22 health physics reports that supports that
23 because they break it out in graphs for the
24 enriched sources that the department
25 (unintelligible).

1 **DR. NETON:** So I guess the answer, John, to
2 your question is if we did have a value that
3 we received was in milligrams, we would assume
4 that it was unenriched uranium.

5 **DR. MAURO:** Okay.

6 **DR. NETON:** But that said, in the CER
7 database all the values have been converted to
8 dpm even though they may have been mass
9 measurements at one point.

10 Number six, an example dose
11 reconstruction is an attempt to illustrate how
12 we would handle, essentially, it's a similar
13 reconstruction using coworker data except the
14 added twist that there is some recycled
15 uranium exposure in this example. In
16 addition, SC&A was interested in determining
17 how we would handle a person exposed to a
18 plethora of different solubility types, the
19 UNH, UF-6, UO-2-F, to pretty much any type of
20 uranium you could have. And we would
21 reconstruct these for cancers of the colon,
22 bone and kidney.

23 The person here started in 1950, ended
24 their employment in 1953, and this again would
25 be an efficiency approach where the person was

1 monitored through urinalysis, but all the
2 results were below the detection limit. So we
3 would use the detection limit to model his
4 exposure assuming a half a value of the
5 detection limit. And then this is another
6 example where you had one result assumed to
7 have a positive value on June 15th, 1952, that
8 exceeded the detection limit.

9 Using these analyses we looked at
10 solubility Types F, M and S. It turned out
11 for all of these, all of the three cancer dose
12 reconstructions that were done, Type-S ended
13 up being the most claimant favorable and was
14 applied to both the missed and measured doses.

15 All these, of course, were modeled
16 using IMBA. I'm not going through some of the
17 details. In addition, it is documented that
18 in '53 recycled uranium was present at the
19 site. Therefore, radionuclides of neptunium,
20 thorium, technetium and plutonium were also
21 added using Table 5.8 of the Technical Basis
22 Document, and they were scaled to the uranium
23 intake. And you can see here the dpm per day
24 intakes for the various radionuclides that
25 were assumed.

1 Doing all this --

2 **MR. RICH:** Jim, this is very claimant
3 favorable primarily because recycled uranium
4 arrived in Y-12 in June of '53, so it was,
5 they assumed --

6 **DR. NETON:** They assumed the exposure
7 started in the beginning.

8 **MR. RICH:** Fifty, which, you know, it's
9 very, very claimant favorable.

10 **DR. NETON:** Okay, thanks.

11 And one interesting thing to know is
12 that the solubility type for some of the
13 recycled uranium is different than S or
14 neptunium, and Technetium-M ended up being the
15 more claimant favorable radionuclide. All
16 that said, we ended up with PCs of 6.7 percent
17 for the colon, 42.8 for bone and 16.6 percent
18 for the kidney.

19 One organ that wasn't on here, and I
20 think I've got an example now that will add in
21 lung cancer. It's pretty clear for a case
22 like this that the lung cancer PC is going to
23 be high, and I don't have it in front of me,
24 but I think it ended up somewhere in the 80
25 percent range. As you can imagine for Type-S

1 inhalations of this magnitude, lung cancer is
2 going to be compensable.

3 **UNIDENTIFIED:** Jim, this is Joe Irana (ph)
4 with ORAU. I just noticed that the recycled
5 uranium was not applied until 1953.

6 **MR. GRIFFON:** Yeah, I was going to say I saw
7 the same thing.

8 **DR. NETON:** It was in '53, but I think what
9 Bryce was saying was it didn't arrive until
10 the middle of '53, and we assumed it was for
11 the whole year. And that's fine. In this
12 particular case the PCs were less than 50, so
13 if we knew that, we should go back and make it
14 more realistic because we don't want, you
15 know, we're sensitive to be making these
16 things much higher than they need to be
17 because it gives claimants a false sense of
18 what the PC may really have been.

19 **MS. MUNN:** Absolutely. If it didn't arrive
20 until mid-June then I think --

21 **DR. MAURO:** -- and doing, I guess, a proof
22 of principle. The fact that you would make
23 that assumption for this purpose is really not
24 a critical issue.

25 **DR. NETON:** Right, yeah, I agree. This

1 isn't going out, this is not going in
2 anybody's record or anything. It probably
3 doesn't make a lot of difference at the end of
4 the day either.

5 Okay, that was example six. Number
6 seven I'm not going to go over because we
7 really didn't do a dose reconstruction. That
8 was a request to indicate how we would handle
9 the Paducah Feed Plant ash which has a much
10 higher ratios of plutonium and other
11 transuranics than what the TBD indicates. And
12 you could read that analysis and see where you
13 land on your opinion of what we're saying
14 there.

15 Case number eight again is another
16 dose reconstruction for colon, bone and liver,
17 and this one I guess is really not that
18 different than the other ones other than that
19 recycled material was present, was
20 reconstructed '53 through '57. I'm not sure
21 how this is different than the other one. So
22 it's essentially the same type of example,
23 it's just more recycled uranium later on.

24 It assumed that this person was not
25 monitored at all for internal dose. I guess

1 that's the key difference here is this was
2 reconstructed using the coworker model. So
3 you have a coworker model to reconstruct
4 internal dose, and then marry that to a
5 scaling factor for recycled uranium. And
6 given that the PCs were 7.4 for colon, 41 for
7 bone and 22.6 for liver.

8 I don't have the lung cancer dose
9 reconstruction, but I assume as well that this
10 one would be well over 50 percent based on
11 these scenarios. The solubility classes that
12 were used are, I'm sure, very similar. It was
13 Type-S for the individual organs even though
14 Type-M was more likely present in the early
15 years at Y-12.

16 That's sort of a thumbnail sketch of
17 what we've put out there. We do acknowledge
18 that we have three dose reconstructions that
19 would be necessary to flesh out the entire
20 picture. And that would be the exotic
21 radionuclides at the cyclotron. At least my
22 intent there is to do something like a
23 Gallium-57 intake assessment, you know, where
24 at cyclotron the Gallium-67 --

25 What did I say? Fifty-seven, sorry.

1 It's getting late in the day.

2 Where a target had ruptured, and we
3 actually have some pretty good data from one
4 of the incident reports to use there. And
5 then the final one would be, well, the final
6 one would be the plutonium-type dose
7 reconstructions for the other radionuclides
8 that would be based on the data that we have
9 in Delta view. So there would be two more
10 there, and then also the additional one that I
11 talked about with the external extremity
12 exposure to betas, case number four.

13 Well, that's it.

14 **MS. MUNN:** Great.

15 **MR. GRIFFON:** And just you mentioned
16 polonium earlier on.

17 **DR. NETON:** Right, we need to take a look at
18 polonium.

19 **MR. GRIFFON:** Whether that's -- I don't even
20 know the quantities or how often those runs
21 took place.

22 **DR. NETON:** Polonium stopped being produced
23 fairly early on. It was the first thing that
24 was run through the cyclotron, and I think
25 polonium production 1951 started, and I think

1 it only ran through like '52. And there was
2 an incident of polonium that was, I think,
3 pretty well documented.

4 **MS. BRACKETT:** Polonium-208.

5 **DR. NETON:** Polonium-208, that's right. And
6 I did check. I think Joyce Lipsztein asked
7 awhile ago if we had Polonium-208, and I think
8 I checked then, but it's in there. It's not
9 your garden-variety polonium, but I guess it's
10 no big deal to add in the half-life and the
11 specific effective energies in there for
12 whatever reason. So we can look at the
13 polonium and the plutonium possibly.

14 **MR. GRIFFON:** Any other comments on the
15 cases?

16 **MR. PRESLEY:** Mark, this is Bob Presley.
17 It's all right if I listen?

18 **DR. WADE:** Yes, it's fine.

19 **MR. GRIFFON:** Yeah, I think we're close to
20 conclusion actually.

21 **DR. WADE:** But it's perfectly acceptable,
22 Robert, for you to listen. You know, it's a
23 public call so feel free to listen.

24 **MR. GRIFFON:** Yeah, and I think that's the
25 way Lew laid out the ground rules earlier on

1 so that's fine.

2 Any other questions on the cases? I
3 think we all, I think we need time to digest
4 these cases obviously, but I think that was a
5 good overview of what the cases are. I don't
6 see any gaps in the types of cases we would be
7 looking for although I think you've covered
8 pretty much --

9 **DR. MAKHIJANI:** Mark.

10 **MR. GRIFFON:** -- the ones we could think of
11 during this process. Yeah.

12 **DR. MAKHIJANI:** This is Arjun. I had a
13 question on the Polonium-208. I understand
14 the internal dose adjustments in terms of the
15 alpha energies and so on. It also has a sort
16 of a one percent decay in the Bismuth-208
17 which has a pretty (unintelligible) gamma
18 component. It doesn't say here in what I have
19 in summary how frequent these gammas, what
20 percentage have 2.6 gamma, and very high
21 energy beta also, .9.

22 **DR. NETON:** I'm sorry, Arjun, I'm having a
23 little trouble hearing you.

24 **MR. GRIFFON:** You're fading off a little
25 there.

1 **DR. MAKHIJANI:** I'm sorry. There's a small
2 minority of Polonium-208 disintegrations, at
3 least in my, I have a little summary table
4 here that shows a Bismuth-208, but probably it
5 wouldn't build up very much. It has a very
6 low half-life. I may not amount to anything
7 but it maybe worth a footnote that there is
8 this thing and it doesn't amount to anything.
9 I don't think it would be significant, it's
10 just --

11 **DR. NETON:** Well, I didn't mean to imply
12 that IMBA would not necessarily have accounted
13 for that. I was just sort of speaking off the
14 top of my head that normally the change of
15 radionuclide, if it doesn't have any sort of
16 other daughters, it's easy to put in this
17 specific effect.

18 **MS. BRACKETT:** They do, they have to do
19 annual doses and they split up energy. So it
20 wouldn't just be taking Polonium-210 and the
21 half-life.

22 **DR. NETON:** So I'm sure, we could take a
23 look at that and verify that we do or do not
24 handle the Bismuth-208 decay mode. And if
25 it's not, figure out why and if it's a problem

1 if it is in there, fine.

2 **DR. MAKHIJANI:** It most likely will not be
3 but just as a check.

4 **DR. NETON:** If it's a minor decay process
5 and it has a much longer half-life than
6 Polonium-208, my gut feeling is that it's not
7 really going to be a dosimetric issue.

8 **DR. MAKHIJANI:** And I agree.

9 **MS. MUNN:** So Mark, what are we expecting in
10 Denver?

11 **CONCLUSIONS**

12 **DR. WADE:** Well, this is Lew. I've kept a
13 list of things that I think, you know,
14 generically we've agreed to. Maybe I could
15 just run that list and then you guys could
16 refine it.

17 **MS. MUNN:** That'd be great.

18 **MR. GRIFFON:** That'd be great.

19 **DR. WADE:** My first item is I think there's
20 the expectation or the hope that John Mauro
21 will notify the working group really quite
22 quickly when the working group could expect to
23 see the SC&A report that would look at their
24 review of the sample DRs. And John, you were
25 going to go back to your place and think about

1 that and give the working group some sense of
2 what they might be able to expect and when.

3 **DR. MAURO:** That's correct.

4 **DR. WADE:** And we appreciate that.

5 I, Lew Wade, am going to seek someone
6 with the wisdom of Solomon to come and explain
7 to the Board what happens if we do, indeed,
8 have a, if you do, indeed, pass on and an SEC
9 is approved that looks at workers who should
10 have been or were monitored for thorium, for
11 example. How would those judgments be made?
12 How would that decision actually be
13 implemented by DOL? And hopefully, we'll have
14 that presentation and discussion at the next
15 meeting.

16 There are a number of issues where
17 NIOSH needs to get final clarifications or
18 some issues to the working group. And I would
19 ask Jim that at some point in time that you
20 would prepare an e-mail to the working group
21 that would contain that information. Maybe
22 you're sharing it as you go, but at some
23 point, maybe at the halfway point between here
24 and the start of the next Board meeting, you
25 would provide information to the Board of the

1 type you promised that you would be
2 considering for them to consider.

3 **DR. NETON:** Lew, I just want to make sure
4 I'm clear. You're talking about what we
5 agreed to look into as far as the resolution
6 matrix as well as the --

7 **DR. WADE:** Right, there were a number of
8 issues where it was open that you were going
9 to provide some further clarification if
10 possible to the working group.

11 **MR. GRIFFON:** Right, I've actually edited
12 the matrix I can probably turn this around by
13 tomorrow even and --

14 **DR. NETON:** Mark, that'd be excellent. I
15 just want to make sure we're all in agreement
16 on what --

17 **MR. GRIFFON:** But there's just a few items,
18 and I think several of them you may have
19 already completed. It's a matter of just
20 making sure we all know where they are.

21 **DR. WADE:** But I would ask that we pick a
22 maybe -- this is, what's today's date?

23 **MR. GIBSON:** It's Tuesday, the 11th.

24 **DR. WADE:** The 11th, and the working started
25 on the 25th, so the halfway point between those

1 two would be the 17th. What day of the week is
2 the 17th? It would be --

3 **MS. MUNN:** It's Monday.

4 **DR. WADE:** Monday, so maybe you could aim,
5 Jim, for a communication by the 17th?

6 **DR. NETON:** That would be next Monday.

7 **DR. WADE:** Again, because we have to give
8 the working group an opportunity to digest
9 this so at least set that as a planning mark
10 if at all possible.

11 And then there needs to be a procedure
12 worked out where SC&A can have meaningful
13 interactions with dose reconstructors. But
14 the way we've left that is that SC&A as it has
15 that need will approach fulfilling that need
16 by contacting Jim. And we have a lot of good
17 examples of how we can do this.

18 And, you know, I think we all trust
19 the good offices of both parties to see that
20 that happens. It will be important for SC&A
21 in the conduct of its review to be able to ask
22 some questions in near real time. I think we
23 all want to work to see that that happens.

24 So that was my list of sort of big
25 items that, generic items not technical items,

1 and Mark and Wanda and Mike, you can add to
2 that as you see fit.

3 **MR. GIBSON:** Lew, if I could, on your item
4 with having DOL brief us about the thorium
5 issue, I would like to expand that to all
6 isotopes, how they, you know, whether there's
7 data, lack of data, how the data's
8 interchanged. It's exposure to any isotope
9 not, in this case particularly it may be
10 thorium, but complex-wide it's just how any
11 isotope --

12 **DR. WADE:** I understand. I will --

13 **MR. GIBSON:** -- or generally how they make
14 those judgments.

15 **DR. WADE:** Well again, all I can do is seek
16 to provide that to you, but I'll work hard.
17 But thank you. That was a very important
18 discussion that you led us in, Mike.

19 **MR. GRIFFON:** And I think you, you know, the
20 matrix items are, there's no need to go
21 through those. I just, I'll turn the matrix
22 around in a day or maybe, well, I should get
23 it out by tomorrow. And, Jim, I'll make sure,
24 maybe even highlight the remaining few that
25 need closure and we can go from there.

1 **MS. MUNN:** Mark, my concern still hanging on
2 the time issue is how we as a working group
3 are going to have an opportunity perhaps in
4 the morning before the meeting begins to meet
5 briefly. Are we not intending to bring
6 recommendation or a presentation to the Board?

7 **MR. GRIFFON:** I'm not sure. What is the
8 schedule, Lew, for the 25th? Is it starting at
9 one p.m.?

10 **DR. WADE:** Well, we're going to start with
11 subcommittee in the morning, so we could make
12 part of the morning available to the working
13 group.

14 **MS. MUNN:** I was just really concerned that
15 we be prepared to present what, if I were not
16 on this working group and on the Board, I
17 would be expecting a recommendation from us.
18 And I'm not at all sure that we have --

19 **MR. GRIFFON:** And I'm not, I mean, we're
20 going to be tight on time because it depends
21 on when John can turn a report around, but I'm
22 guessing that it'll be up against the time
23 limit.

24 **MS. MUNN:** Yes, I suspect so, too, and my
25 concern is that we have at least enough of a

1 presentation available for them to let them
2 know what issues were addressed by the matrix.

3 **DR. WADE:** We could hold open the
4 possibility of a call like this any time
5 between now and the start of the Board meeting
6 on the 25th. We could schedule time on the
7 evening of the 24th.

8 **MS. MUNN:** I think that would be wise for us
9 to do some such thing. I'm not sure exactly
10 what's the best date for that, but it seems to
11 me -- do you have that feeling? Am I the only
12 one that's concerned about this? Mark? Mike?
13 What?

14 **MR. GIBSON:** Not at all.

15 **MR. GRIFFON:** No, you're not the only one.

16 **MS. MUNN:** I just want to make sure that
17 when we get to the time certain we're not
18 going to be in a position of saying, well, the
19 working group got through most of this except
20 that we still need this from this person and
21 this from that person.

22 **DR. WADE:** Well, what I'll do tomorrow is
23 I'll have LaShawn to query the three members
24 of the working group, Mike, Mark and Wanda as
25 to time available for a conference call, say

1 starting from the 17th all the way up through
2 the 24th. And then once you're in receipt of
3 John Mauro's communication, then I'll be in
4 touch with Mark and we can decide when we want
5 to schedule such an interaction.

6 **DR. MAURO:** Lew, for many of us we'll be
7 traveling on the 24th, so the meeting if we are
8 going to have a conference call to see where
9 we are, probably would have to on, you know,
10 up to the 21st. I believe I'll be flying most
11 of the day on the 24th.

12 **DR. WADE:** Well, we'll put out a feeler
13 tomorrow to see, so we'll plan ahead a little
14 bit, but we'll hold open the possibility of
15 the working group getting together to look at
16 the recent information and try and consolidate
17 a recommendation to the Board.

18 **MS. MUNN:** I think that's wise.

19 **MR. GRIFFON:** Timing is critical. The other
20 thing hanging out there is that we still, you
21 know, we'll try and get some information from
22 DOL, but that's not going to happen until the
23 Board meeting. That might also --

24 **DR. WADE:** Right, but then I think the whole
25 Board needs to hear that. I mean, there's no

1 processing you'll need to do on there.

2 **MS. MUNN:** It's our job. Bob, you said
3 something?

4 **MR. PRESLEY:** Am I still not part of the
5 working group or something that I'm not privy
6 to?

7 **DR. WADE:** No, you're part of the working
8 group although I just have to determine
9 whether I can do this call as a public meeting
10 or not based upon my ability to do Federal
11 Register material. So if we can do it as a
12 public meeting then you would be privy to the
13 discussion, Bob, but I have to work those
14 details out.

15 **MR. PRESLEY:** Okay.

16 **MS. MUNN:** Well, just look for the e-mail.

17 **MR. GRIFFON:** And John, you'll let us all
18 know within a few days anyway, right, what --

19 **DR. MAURO:** Well, the next step right now is
20 I've got to caucus with the crew and get our
21 bearings and get back to you very quickly. My
22 guess is within a day or two we should be able
23 to give you a date for when we will be able to
24 provide you with our findings regarding the
25 various cases.

1 Jim, as soon as you can get us the
2 other cases the better.

3 DR. NETON: Will do.

4 DR. MAURO: We certainly have plenty to do
5 to start right now with the cases you already
6 provided us.

7 MS. MUNN: Jim, if it's not too inconvenient
8 for you, if you have them in electronic form,
9 if you'd send them to the members of the
10 working group here as well as putting them on
11 the O drive because some of us are still a
12 year behind for where we ought to be.

13 DR. NETON: That's fine. I can do that. I
14 may have to break them up. There's --

15 MR. GRIFFON: There's a lot of pieces.

16 DR. NETON: -- a lot of pieces of
17 spreadsheets that might be too big.

18 MS. MUNN: Well, not to worry.

19 DR. NETON: I will do it.

20 MS. MUNN: Appreciate it.

21 DR. NETON: Mark, could I ask you a favor?
22 When you do the resolution matrix, could you
23 somehow like highlight the ones that stand out
24 in your mind so that --

25 MR. GRIFFON: I think I will put them in

1 yellow highlight.

2 DR. NETON: Yellow or something so that,
3 because that would just be more obvious.
4 Sometimes --

5 MR. GRIFFON: Right, they're buried in the
6 paragraph. I will do that.

7 DR. MAURO: If I could make just a brief
8 announcement for the SC&A people on the line.
9 After we finish up, could we have a conference
10 call at five o'clock? Could you call on our
11 standard number? Joe, are you still on?

12 MR. GRIFFON: Have they all hung up?

13 DR. MAURO: I'll take care of it. Don't
14 worry about it.

15 MR. TANKERSLEY: Bill's still here. I can
16 call in at five.

17 MR. GRIFFON: Okay, I think we're all set.
18 Anything else from any work group members or
19 anyone else, Jim or Lew, any closing comments?

20 DR. NETON: No, I'm fine.

21 MR. GRIFFON: I think we're good until
22 tomorrow morning then for ten a.m. I think on
23 Rocky, right?

24 DR. WADE: Yes.

25 MS. MUNN: Yes.

1 **DR. WADE:** Thank you for a long and
2 productive day.

3 **MS. MUNN:** We will see you tomorrow morning
4 at seven o'clock my time.

5 **DR. MAURO:** I think that's right, ten
6 o'clock eastern?

7 **MS. MUNN:** Ten o'clock eastern.

8 (Whereupon, the working group teleconference
9 concluded at 4:40 p.m.)
10

1

CERTIFICATE OF COURT REPORTER**STATE OF GEORGIA****COUNTY OF FULTON**

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of April 11, 2006; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 4th day of July, 2006.

STEVEN RAY GREEN, CCR**CERTIFIED MERIT COURT REPORTER****CERTIFICATE NUMBER: A-2102**